The Dissertation Committee for Mikaela Kathlene Sebree certifies that this is the approved version of the following dissertation:

Child, Caregiver, and Family Predictors of Rates of Growth in Clinical and Functional Outcomes in Systems of Care

Committee:

_____
Christopher J. McCarthy,
Co-Supervisor

_____
Keenan Pituch,
Co-Supervisor

_____
Michele Guzman

_____
Aaron Rochlen

_____
David Springer

_____
Ranilo Laygo

Child, Caregiver, and Family Predictors of Rates of Growth in Clinical and Functional Outcomes in Systems of Care

by

Mikaela Kathlene Sebree, B.S.; M.S.

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The findings and conclusions in this dissertation are those of the author and do not necessarily represent the views of the Child, Adolescent and Family Branch, Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, United States Department of Health and Human Services.

Child, Parental, and Family Predictors of Clinical and Functional Outcomes in Systems of Care

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Mikaela Kathlene Sebree, Ph.D.

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Co-Supervisor: Christopher J McCarthy

Co-Supervisor: Keenan Pituch

Over the last several decades there has been a growing recognition that children with serious emotional disturbances are considerably underserved. The Comprehensive Community Mental Health Services for Children and Their Family Program is the largest federal grant program to help communities to implement, advance, and evaluate the system of care approach to service delivery. One of the goals of the evaluation has been to determine if children who participate in system of care services demonstrate improved clinical and functional outcomes over time. Prior research has revealed that children do display significant improvements over time. While this research is promising, it is also important to explore the variability in the rates of improvement to determine who benefits the most from system of care services. This dissertation explores the predictive role of a selected group of variables (behavioral and emotional strengths, caregiver strain, and

demographic variables) on differential rates of improvements in clinical and functional outcomes over time for children who participate in systems of care. These variables were also examined in relation to differences in levels of clinical and functional impairments at intake into system of care services.

The results from the latent variable quadratic growth models indicated that children who are served by systems of care displayed significant improvements in clinical and functional outcomes over time, with the greatest improvement occurring in the first six months. Children's behavioral and emotional strengths, caregiver strain, sex, age, and race significantly predicted differences in instantaneous growth, as well as rates of deceleration, for clinical and functional outcomes. Clinical implications, limitations of the study, and directions for future research are discussed.

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Chapter 1: Introduction

According to the Surgeon General's Report on Mental Health, approximately 20% of children in the United States are affected by a mental health disorder at any one point in time (U.S. Department of Health and Human Services, 1999). In addition, mounting evidence suggests that children with serious emotional disturbances are considerably underserved, with thousands likely not receiving needed services (Manteuffel, Stephens, & Santiago, 2002). Manteuffel et al. (2002) further suggests that those children who do receive services are often served inappropriately or ineffectively. Consequently, identifying and developing effective service delivery systems for children and adolescents with emotional disturbances are central themes in outcome research.

In response to findings highlighting the deficiencies inherent in fragmented community mental health services for children with serious emotional disturbances, the Child and Adolescent Service System Program (CASSP) was formed with the goal of reforming traditional mental health services for children and adolescents (Lourie, Stroul, & Friedman, 1998; Stroul, 2003; Stroul & Friedman, 1986). As part of CASSP, Stroul and Friedman (1986) developed a philosophical framework for a system of care approach to delivering comprehensive, community-based mental health services to children with serious emotional disturbances and their families. Since its inception, the system of care approach to service delivery has played an influential role in the development of comprehensive community mental health services for children and their families across the United States (Holden, Friedman, & Santiago, 2001).

Since the early 1990s researchers have been evaluating the implementation and effectiveness of the system of care approach to service delivery across the United States (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2001; Holden et al., 2003; Manteuffel et al, 2002; Rosenblatt, 1998; Vinson, Brannan, Baughman, Wilce, & Gawron, 2001). One goal of this evaluation is to determine if children and adolescents with serious emotional disturbances who are served by systems of care demonstrate significant improvements in clinical and functional outcomes.

Paul (1967) posed the following question which has frequently been cited as a guide for outcome research: "*What* treatment, by *whom*, is most effective for *this* individual with *that* specific problem, under *which* set of circumstances" (p. 111). Consistent with the broader field of clinical outcome research, studies investigating the effectiveness of the system of care approach have addressed only part of Paul's (1967) question. In general, researchers have largely neglected the important role of individual, psychosocial, and contextual variables that may influence clinical and functional outcomes for youth (Durlak & McGlinchey, 1999; Kazdin, Bass, Ayers, & Rodgers, 1990).

Kazdin (1990; 1995b) stated that the goals of outcome research are not only to identify effective approaches to treating children with psychiatric disturbances and explore the mechanisms of therapy, but also to identify individual and contextual factors that may moderate the effect of treatment outcomes. Similarly, Durlak and McGlinchey (1999) recommend that outcome studies must go beyond a simple demonstration of the effectiveness of an approach to treatment by examining variables that may contribute to treatment outcomes.

Although the literature suggests that treatment within systems of care leads to significant improvements in clinical and functional outcomes over time, there continues to be children who do not demonstrate such improvements, with some children actually demonstrating a deterioration in functioning over time (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2001; Manteuffel et al, 2002). Researchers have not accounted for the discrepancies in clinical and functional outcomes for these youth. Exploring the relationship between individual, psychosocial, and contextual variables and the clinical and functional outcomes of children served in systems of care may provide some insight into these discrepancies. Understanding this relationship may also help identify who is best served by the system of care approach. Finally, with this knowledge, clinicians could tailor specific interventions for each child served in systems of care to either bolster those factors related to better treatment outcomes or target those related to poorer treatment outcomes, possibly improving their chances for improved clinical and functional outcomes.

Identifying the factors that predict treatment outcomes is difficult because few studies have explored this relationship (Durlak & McGlinchey, 1999). In addition research in this area has revealed mixed results (Andrade, Lambert, & Binkman, 2000; Barkley, Gueveremont, Anastopoulos, & Fletcher, 1992; Gorin, 1993; Kazdin & Wassell, 2000; Target & Fonagy, 1994; Weisz, Weiss, Han, Granger, & Morton, 1995).

Theory rarely guides research regarding moderators of therapeutic change; however, the use of theory is necessary in order to obtain a better understanding of how psychosocial variables contribute to treatment outcome (Kazdin, 1999). Ecological systems theory emphasizes how children are influenced by the different contexts in which

they develop (Bronfenbrenner, 1979) and may provide the necessary framework to identify and understand the variables that relate to clinical and functional outcomes within system of care. To obtain a comprehensive view of those factors that may contribute to treatment outcomes with systems of care, it is essential to identify those variables that may help to account for differences in clinical and functional outcomes

Although the system of care philosophy emphasizes a strengths-based perspective that recognizes the importance of children's strengths and resources (Stroul & Friedman, 1986), no available research to date has investigated the influence of children's behavioral and emotional strengths on clinical and functional outcomes within systems of care. It is likely that these strengths may impact clinical and functional outcomes success as it has been suggested that children's behavioral and emotional strengths are predictive of adaptive functioning (Epstein, Nordness, Nelson, & Hertzog, 2002). Further, given the important role of the family for children (Bronfenbrenner, 1979), it is likely that parent and family variables may influence clinical and functional outcomes.

This dissertation seeks to examine differential rates of improvement in clinical and functional outcomes in a population of children with serious emotional disturbances who were enrolled services in systems of care. More specifically, this study will determine if the following variables predict differences in growth rates for clinical and functional outcomes for youth who participate in system of care services: 1) behavioral and emotional strengths, 2) family functioning, 3) caregiver strain, and 4) demographic information (e.g. age, sex, and race). The predictive role of these variables will also be examined in relation to levels of clinical and functional impairment at intake into services. Two-level latent variable quadratic growth curve modeling will be utilized to

explore the relationship between predictor variables and change in clinical and functional outcomes over a period of two years.

Chapter 2: Review of the Literature

SYSTEMS OF CARE

In the late 1960's the Joint Commission on the Mental Health of Children (1969) reported that mental health services for children with serious emotional disturbances were grossly inadequate. The report highlighted that only a small percentage of children with serious emotional disturbances were receiving mental health services and those who actually did obtain services received inappropriate care, often being placed in excessively restrictive settings. The conclusions drawn from the Commission's report called for major reform of the fragmented children's mental health service system (Joint Commission on the Mental Health of Children, 1969).

In response to this report and other similar findings over the following decade, the National Institute of Mental Health developed the Child and Adolescent Service System Program (CASSP) in 1984. CASSP was assigned two main tasks of further elucidating and defining the concept of a system of care and helping states to develop and implement their own comprehensive, coordinated, community-based systems of care for children with serious emotional disturbances (Lourie et al., 1998; Stroul, 2003; Stroul & Friedman, 1986). As a means of carrying out these tasks, CASSP provided federal grant money to states, communities, territories, and Native American tribes to develop systems of care.

As stated above, one CASSP's major tasks was to further clarify a system of care approach to service delivery. Stroul and Friedman (1986) outlined a philosophical

approach to comprehensive, community-based mental health services to children with serious emotional disturbances, providing the basic framework for the system of care as it is used today. Stroul and Friedman (1986) define a system of care as "a comprehensive spectrum of mental health and other necessary services which are organized into a coordinated network to meet the multiple and changing needs of severely emotionally disturbed children and adolescents" (p. 3). Based on this approach to service delivery, the various agencies who provide services to children (e.g. mental health, child welfare, juvenile justice, and education), all work collaboratively to provide an array of coordinated and comprehensive services for children with serious emotional disturbances. It is important to highlight that the system of care is not a discrete treatment program per se, but rather a philosophical framework based on a set of core values and principles for how services should be delivered to children and their families (Stroul, 2003; Stroul & Friedman, 1986). These values and operational principles are then used as a guide for communities to utilize when developing their own systems of care such that each community will implement service systems in different ways, with different organizational structure, and providing different service arrangements (Stroul, 2003; Stephens, Holden, & Hernandez, 2004). Inherent in this philosophical approach to service delivery is the belief that if mental health services are provided in accordance to the system of care approach, clinical and functional outcomes for children will be better than for those children who received traditional, fragmented services (Manteuffel et al., 2002).

Stroul and Friedman (1986) identified a set of three core values and ten guiding principles of systems of care to assist communities in developing systems of care. The

core values suggest that systems of care should provide services that are child-centered and family focused, community-based, and culturally competent. The first principle suggests that children should have access to a broad and comprehensive array of services which address not only their mental health needs, but also their physical, educational, and social needs. Given the unique needs of children with serious emotional disturbances, the second principle calls for services to be individualized in order to adequately meet the child's multiple and changing needs. In response to previous findings that suggested children with emotional disturbances were often placed in excessively restrictive settings, the third principle states that children should receive services in the least restrictive setting as possible. The fourth principle highlights the importance of family involvement, recommending that families, or primary caregivers, be active participants throughout the planning and delivery of services. The fifth principle calls for service integration, such that the various agencies work together, forming networks of coordinated services. In order to ensure that children receive the well coordinated services that they need, the sixth principle demands that children be provided with case management to facilitate service coordination. Given that one of the goals of systems of care is to reduce the prevalence of emotional disturbance, the seventh principle proposes that systems of care provide early identification and intervention services for those children who are at risk for serious emotional difficulties. The eighth principle suggests that services be in place to facilitate the transition of children from system of care services to adult service systems as they reach adulthood. The ninth principle suggests that the children's rights be protected and advocated. Finally, the tenth principle posits that all children with serious emotional disturbances and their families should have access to quality services

regardless of race, religion, physical disability, or other characteristics (Stroul, 2003; Stroul & Friedman, 1986). These guiding principles are used as a framework for the ways services should be provided to children and their families. As alluded to previously, each community applies this framework differently so that the system of care is implement in a way that best fits the community's needs and available resources (Lourie et al, 1998).

In addition to the three core values and ten guiding principles, there are eight dimensions of service that a system of care should provide in order to meet the multiple needs of its children and their families. The first and most critical dimension is mental health services. This set of services includes both residential (e.g., therapeutic foster care, residential treatment services, inpatient hospitalization, etc.) and nonresidential services (e.g., assessment, outpatient treatment, prevention, etc). Social services is another dimension and includes services such as child protective services, respite care, foster care, and financial assistance. The third dimension of services is educational services. Included in this dimension are both regular and special educational classroom settings, alternative and special schools, and academic assessment services. General health services is another important dimension and includes such services as health education and prevention, primary and acute care, and screening and assessment. A fifth dimension of services is substance abuse treatment services. Vocational services is another dimension. These services include such assistance as career education, vocational assessment, skills training, and job finding services. Another dimension is recreational services which includes after school programs, summer camps, relationships with significant others, and special recreational projects. The final dimension of services

is operational services and includes case management, self help and support groups, juvenile justice services, advocacy, transportation, legal services, and volunteer programs (Stroul, 2003; Stroul and Friedman, 1986). Each child who participates in their community's system of care may receive a different package of services depending on their own and the family's unique needs, as well as the child's level of functioning and individual strengths (Lourie et al., 1998; Stroul, 2003).

EVALUATING SYSTEMS OF CARE

Building on the foundation established by CASSP, the Comprehensive Community Mental Health Services for Children and Their Families Program was created in fiscal year 1992 by section 561 of the Public Health Services Act. The program was developed to provide states, territories, communities and Indian Tribes funding to develop, expand, and improve their systems of care. Grants were awarded beginning in October of 1993. Since then, 96 communities have been awarded grants, totaling more than $850 million. It is currently the largest child mental health services initiative ever funded (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003).

In 1994, a national evaluation of the program was funded. The national evaluation was designed to examine both system-level and program-level changes, as well as individual outcomes, in order to address questions about the effectiveness and efficiency of the system of care approach to service delivery (Holden et al., 2003). One of the critical questions addressed by the evaluation is whether children who are served in systems of care demonstrate significant improvements in clinical and functional

outcomes over time. Other questions addressed in the evaluation include the cost effectiveness of such an approach, the necessary ingredients to sustain systems of care, consumer satisfaction with the system of care, and implementation fidelity across sites (Holden et al., 2003).

Determining the effectiveness of systems of care, however, is extremely complex given the multiple levels of evaluation, as well as the flexibility with which the system of care philosophy can be operationalized in each grant community. Due to the complexity of the task, the national evaluation of the program has traditionally included several components to address the various aspects of the system of care approach. The System of Care Assessment focuses on the implementation of the system of care philosophy in each of the grant communities. As the title implies, the Cross-Sectional Descriptive Study examines children's descriptive information such as child and family demographic data, diagnostic information, clinical and functional status, living arrangements, risk factors, and mental health service history. The Services and Costs Study addresses service information such as the types of services children received, service utilization patterns, and the cost of such services. The Longitudinal Comparison Study compares system of care grant communities and non-system of care communities across a variety of outcomes. Finally, the Child and Family Outcome Study explores how systems of care affect clinical and functional outcomes for youth who participate in such systems.

Throughout the program, there have been four major funding cycles or phases. A phase is defined by the funding year and is comprised of the cohort of grant communities that received grants during that year. All funded communities are required to participate

in the national evaluation. The national evaluation is similarly divided into four major phases to coincide with the funding cycles.

Phase I consisted of 22 grantee communities who were awarded funding in October 1993 and through October 1994. For the evaluation, qualitative and quantitative data were collected to assess two broad domains: infrastructure and service delivery. Data were collected at baseline, six months, one year and annually thereafter for up to thirty-six months. The following information was collected during Phase I: Demographic information, clinical characteristics of the children and families, educational indicators, juvenile justice indicators, the Child Behavior Checklist (CBCL), the Youth Self-Report (YSR), the Child and Adolescent Functional Assessment Scale (CAFAS), Youth and Family satisfaction questionnaires, and the Family Empowerment Scale (FES) (Center for Mental Health Services, 1998; 1999; Holden et al., 2003). Overall, the results supported the implementation of the system of care principles within these community sites (Center for Mental Health Services, 1998; 1999; Vinson et al., 2001).

The Phase I evaluation revealed significant opportunities to revise the assessment protocol for Phase II and subsequent phases of the national evaluation. The twenty-three grantee communities who received funding in 1997 and 1998 made up Phase II of the national evaluation. Phase III of the evaluation consisted of twenty-two additional grantee communities who received funding in 1999 and 2000. Children who participated in this phase of the evaluation were followed from initiation into services for up to thirty-six months, even if they were not currently enrolled in services. The revised assessment protocol consisted of the following: demographic information, clinical history of the children and families, child medications and chronic illness information, educational

indicators, juvenile justice indicators, stability of living situations, delinquent behaviors, the Child Behavior Checklist (CBCL), the Youth Self-Report (YSR), the Child and Adolescent Functional Assessment Scale (CAFAS), Behavioral and Emotional Rating Scales (BERS), Family Assessment Device (FAD), Family Resource Scale (FRS), Caregiver Strain Questionnaire (CGSQ), and Youth and Family satisfaction questionnaires (Center for Mental Health Services, 1999; 2000; 2001; Holden et al., 2003).

As mentioned previously, a subcomponent of the national evaluation includes the Child and Family Outcomes Study which examines change over time in clinical and functional outcomes for children participating in system of care services. Change over time was assessed across a number of domains including clinical symptomology, functional impairment, behavioral and emotional strengths, family functioning, caregiver strain, substance use, academic attendance and performance, involvement with juvenile justice, service utilization, and service satisfaction. The inclusion of a measure of functional impairment, as well as emotional and behavioral symptomology, is a unique and important aspect of the national evaluation. Functional impairment refers to the impact of the child's emotional and behavioral difficulties on the child's ability to function across a variety of different domains (Center for Mental Health Services, 2000; 2001). With respect to individual clinical and functional outcomes, the literature on systems of care has consistently demonstrated that children with serious emotional disturbances who participate in systems of care show significant clinical and functional improvements over time (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003; Manteuffel et al., 2002; Rosenblatt, 1998). Children demonstrated

significant declines in functional impairment across all domains over time as measured by reductions in the total CAFAS scores. Data also revealed significant improvements in clinical symptomology as indicated by reductions in internalizing, externalizing, and total problem scores on the CBCL over a two year period (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden, 2003; Manteuffel et al., 2002). While there were significant reductions in clinical and functional impairments over time, some children failed to demonstrate similar improvements in outcomes (Center for Mental Health Services, 1999; Manteuffel et al., 2002).

Although the results from such studies are promising, they are not complete as there are still several areas of research on the system of care that are largely unexplored. As mentioned previously, clinical and functional mental health outcomes are influenced by multiple factors (Holden et al., 2003). Similar to other outcome studies, much of the current research on the clinical and functional outcomes within the system of care has focused on the general effectiveness of the system of care approach while paying little attention to the factors that may actually contribute to the outcomes of such an approach (Durlak & McGlinchey, 1999; Durlak, Wells, Cotton, & Johnson, 1995; Kazdin, 1995a; Kazdin, Bass et al,, 1990; Kazdin, Siegel, & Bass, 1990; Peterson & Bell-Dolan, 1995). However, it is not enough for researchers to simply demonstrate the effectiveness of the system of care for children. Research must also explore the factors that contribute to differences in clinical and functional outcomes within systems of care to understand for whom and under what conditions such an approach is most effective (Durlak & McGlinchey, 1999; Holden et al., 2003; Kazdin, 1999; Kazdin, Bass et al., 1990; Kazdin, Siegel et al., 1990). Given that systems of care have played a major role in organizing

and developing community based mental health services to children throughout the United States (Holden et al., 2001), it is important to obtain a more comprehensive understanding of the system of care approach to service delivery to better provide effective services to children with serious emotional and behavioral disorders by addressing the psychosocial and contextual variables that may contribute to differences in clinical and functional outcomes.

PREVIOUS PREDICTORS OF PSYCHOTHERAPY OUTCOME

Given that any therapeutic intervention is differentially effective with any given proportion of children, it is important to identify those individuals who are more or less likely to respond to therapy. Prior to entering treatment, multiple influences contribute to a child's current level of functioning (Kazdin, 1995b). It logically follows that many of these factors may also contribute to clinical and functional outcomes. Variations in outcomes are likely due not only to differences in the treatment an individual receives, but also to the individual variables children bring with them when they enter therapeutic treatment (Kazdin & Wassell, 1999; Phillips et al., 2000). Therefore, the effectiveness of any therapeutic intervention will depend on a multitude of psychosocial and contextual variables. These factors generally fall into four broad categories: (a) treatment variables (for example specific techniques, treatment dosage), (b) characteristics of the therapist (for example years of experience, relationship with the child), (c) characteristics of the child (for example age, IQ, severity of psychosocial problems), and (d) parental and family variables (for example family dysfunction, SES, parental psychopathology). Ultimately, identifying the psychosocial and contextual variables that contribute to

treatment outcomes can facilitate the delivery of therapeutic services by providing avenues for the improvement of treatment effectiveness (Kazdin & Wassell, 1999; March & Curry, 1998). Ascertaining predictors of treatment outcomes further allows clinicians to target those variables in treatment that may act as risk factors for treatment failure or bolster those variables that contribute to treatment success.

Demographic Variables

Research has also explored the role of children's age and gender on treatment outcome with inconclusive results. Casey and Berman (1985), in their meta-analysis of child psychotherapy, concluded that although psychotherapy was effective across a variety of diagnoses and types of therapy, there was some evidence for gender differences in treatment outcomes with males showing poorer treatment response. However they found no differences in treatment outcome for children's age or grade level. Similarly, Weisz et al., (1995) revealed a gender difference in outcomes, with those studies having a greater proportion of female subjects yielding greater effect sizes. Unlike Casey and Berman (1985), the meta-analyses conducted by Weisz and his colleagues (Weisz, Weiss, Alicke, & Klotz, 1987; Weisz et al., 1995) found opposing results regarding the relationship between age and therapeutic improvement. The results of one meta-analysis demonstrated better treatment outcomes for children compared to adolescents (Weisz et al., 1987), while a later meta-analysis found larger effect sizes for adolescents than for children (Weisz et al., 1995). Kazdin and Crowley (1997) observed both an age and gender effect on treatment outcome, suggesting that girls demonstrated better treatment response than boys and older children evidenced better treatment outcomes than younger children. Within the system of care, a relationship between changes in functional

impairment on the CAFAS over time and gender has been found. Specifically, the results suggested that although both boys and girls demonstrated significant improvement over time, boys continued to display greater levels of functional impairment between intake and one year into services (Center for Mental Health Services, 1999; Manteuffel et al., 2002).

Phillips et al. (2000) reviewed the literature regarding the best predictors of treatment outcomes for adolescents and concluded that the effects of age and gender varied by diagnoses. Consistent with the results of Weisz et al. (1987), the results of Target and Fonagy's (1994) study indicated that younger children showed more therapeutic improvement compared to adolescents. They proposed that the age effect might be a result of the differences in the severity of diagnoses among younger children and adolescents. Adolescents are more likely to be diagnosed with disorders such as conduct disorder or depression that have poorer prognoses than disorders more common in younger children such as separation anxiety or phobias. Finally, Barkley et al. (1992) and Kazdin and Wassell (2000) reported that neither age nor gender were predictive of treatment outcome.

Family socioeconomic status has also been investigated as a predictor of treatment outcomes (Barkley et al., 1992; Freidman, Glickman, & Morrissey, 1986; Kazdin, 1995a; Kazdin & Wassell, 2000; Phillips et al., 2000). Drawing from the literature on socioeconomic disadvantage as a risk factor for emotional and behavioral problems in children, Kazdin and his colleague predicted that socioeconomic status would be related to treatment outcomes (Kazdin & Wassell, 2000). The results from Kazdin and Wassell's (2000) study confirmed their hypotheses that greater

socioeconomic disadvantage would predict poorer treatment response. Friedman, Terras, & Kreisher (1986) explored several client characteristics in relation to treatment outcomes in an adolescent drug abuse program and found that middle to upper class socioeconomic status predicted better treatment outcomes. However, other researchers have not found socioeconomic status to be significantly related to treatment outcome (Barkley et al., 1992; Kazdin, 1995a). In a study of children diagnosed with attention-deficit hyperactivity disorder, Barkley et al. (1992) determined that paternal socioeconomic status was not predictive of therapeutic change. Likewise, Kazdin (1995a) also found that several demographic variables, including socioeconomic status and family income, failed to account for a significant amount of the variance in treatment response.

Parental Functioning

Several researchers have explored the role of parental psychopathology on treatment outcomes (Barkley et al., 1992; Kazdin, 1995a; Kazdin & Crowley, 1997; Kazdin & Wassell, 1999; Target & Fonagy, 1994), and the results generally suggest that parental dysfunction is a significant predictor of therapeutic outcome. Kazdin and his colleagues (Kazdin, 1995a; Kazdin & Crowley, 1997; Kazdin & Wassell, 1999) explored parental functioning as a moderator of treatment outcomes in antisocial children speculating that parental psychopathology would influence treatment success given its role in the etiology and prognosis of conduct related disorders. Consistent with their expectations, the results of these studies found parental dysfunction to be a significant predictor of therapeutic change. Thus, parental psychopathology was related to poorer treatment outcomes. Similarly, Target and Fonagy (1994) demonstrated a significant

relationship between impaired parental mental health and poor treatment response in children younger than six years old and in adolescents. However, their results also indicated an opposite relationship in children between the ages of six and twelve, in that parental dysfunction predicted more *positive* treatment outcomes. Not all studies have found a significant relationship between parental psychopathology and treatment outcome. For example, Barkley et al. (1992) observed that parental psychopathology was not a significant predictor of treatment outcomes in a study of children with attention-deficit hyperactivity disorder.

Clearly, given the conflicting results regarding age, gender, socioeconomic status, and, parental psychopathology, it is impossible to make conclusions about the roles these variables may play in treatment outcomes. Therefore it seems important that future research address these variables and attempt to clarify these inconsistencies or at least to control for differences in these variables as potential sources of variance.

Given the relative paucity of studies investigating factors that affect treatment outcomes, it is premature to draw definitive conclusions regarding the best predictors of treatment outcomes. A few studies have investigated a variety of variables, including, age, gender, family functioning, and parental psychopathology as potential sources of variance that contribute to treatment success, but have produced conflicting results. Moreover, as of yet there have been no available studies exploring moderators of clinical and functional outcomes for youth within systems of care. In order to identify those factors that are the most important in influencing treatment outcomes in the system of care, these and other variables should be explored further to determine the necessity of their inclusion as predictors of treatment outcome (Durlak & McGlinchey, 1999). In

addition, given the important role the system of care has played in developing community based mental health services to children with serious emotional disturbances, it seems important to investigate predictors of clinical and functional outcomes within the system of care.

THEORETICAL FRAMEWORK FOR PREDICTORS OF TREATMENT OUTCOME

Kazdin (1999) points out that theory rarely guides research regarding predictors of treatment outcome and argues that such predictors should be theoretically derived in order to facilitate a better understanding of how these variables contribute to treatment success. The goal of the remainder of this chapter is to establish a theoretical background for exploring particular child and family contextual variables that may be potential sources of variance in treatment outcomes within the system of care. It should be noted that this theoretical framework is being used as a guide for the selection of potential predictors of treatment outcomes and will not be explicitly tested in the proposed study.

Ecological systems theory (Bronfenbrenner, 1977; 1979) is a broad theory of development and may provide a theoretical framework for identifying the psychosocial and contextual variables that contribute to therapeutic change. One of the primary assumptions of ecological systems theory is that children grow up within multiple social contexts and systems of relationships, and these different contexts and relationships exert influence on the child's development and behavior (Bronfenbrenner, 1977; 1979). Another key assumption is the bi-directional, reciprocal influence within the systems. Not only are children influenced by their environments, but the environments are also influenced by children (Bronfenbrenner, 1979). Moreover, the principle of reciprocity

applies not only to relationships within the various contexts, but also between the levels of contexts (Bronfenbrenner, 1977; 1979).

Bronfenbrenner (1979) conceptualized the child's environment as comprised of several complex layers of social context, each having a bi-directional influence on child outcomes. The innermost layer of the child's environment, the microsystem, includes the immediate setting in which the child exists. The microsystem is the child's primary context containing family, school, and peer groups. Within the child's microsystem are relationships between the child and his or her immediate environment such as relationships with parents, siblings, teachers, and peers. In the next layer, the mesosystem, are the relationships and interactions among two or more microsystems. In other words, the mesosystem consists of the relationships between the various aspects of the child's lived-in environment. The exosystem is the next layer and it consists of settings that do not include the child directly but affect the child via their influence on the micro- or mesosystem. The exosystem includes such influences as the parents' workplace and socioeconomic status. The macrosystem is the larger context of abstractions such as cultural or political ideologies which also influence the child's development (Bronfenbrenner, 1977; 1979).

The study of developmental psychopathology has extended ecological systems theory by providing evidence supporting the notion that adaptation and maladaptation is determined by a number of contextual influences (Toth & Cicchetti, 1999). Additionally, Cicchetti (1994) suggests that the way children cope with particular challenges is determined by various contextual factors which in turn influence children's successful or unsuccessful adjustment. Consequently, it is important to consider the

various social contexts in which the child lives as these contexts have implications for a child's adaptation and dysfunction (Bronfenbrenner, 1979; Weisz, Huey, & Weersing, 1998). It seems that exploring factors within the child's contexts will likely facilitate the identification of potential predictors of child therapy outcome. Therefore, although it is important to identify individual child variables that contribute to therapeutic change, it is necessary to address other parent, family, and contextual characteristics that are likely to be related to clinical and functional outcomes (Kazdin & Crowley, 1997).

BEHAVIORAL AND EMOTIONAL STRENGTHS

Consistent with traditional approaches to assessment, the majority of studies that have addressed predictors of treatment outcome have used a deficit-based perspective that focuses on children's deficits, problems, and dysfunctions (Epstein et al., 2002). However, clinicians and researchers have recently begun to question a deficit-based approach, advocating the importance of including measures of children's prosocial or adaptive functioning using strength-based assessment (Epstein, Dakan, Oswald, & Yoe, 2001; Epstein & Sharma, 1998; Kazdin, 1995b). Epstein and Sharma (1998) define strength-based assessment as "the measurement of those emotional and behavioral skills, competencies, and characteristics that create a sense of personal accomplishment; contribute to satisfying relationships with family members, peers, and adults; enhance one's ability to deal with adversity and stress; and promote one's personal, social, and academic development" (p. 3).

Examining the contribution of children's behavioral and emotional strengths to clinical and functional outcomes offers a number of advantages over traditional deficit-

based approaches. Epstein (1999) proposes that a key disadvantage of the deficit-based approach is that it emphasizes the negative aspects of a child's life, while neglecting the child's assets and adaptive functioning. However, all children, regardless of their level of dysfunction, possess a number of adaptive skills, competencies, and resources that may have implications for current and long-term adjustment (Epstein & Sharma, 1998; Kazdin, 1995b). Consistent with ecological systems theory, strength-based assessment evaluates children's emotional and behavioral strengths across a variety of contexts including family, social, vocational, and educational domains (Bronfenbrenner, 1979; Epstein, 1999). In addition, identifying children's resources and competencies can guide mental health interventions by changing the emphasis of therapy from fixing the dysfunctional behavior to enhancing children's assets (Epstein et al., 2002; Epstein & Sharma, 1998).

The field of counseling psychology recognizes the importance of individual strengths and emphasizes using clients' behavioral and emotional resources in therapy (Murphy & Dillon, 1998). The system of care philosophy also underscores the importance of children's strengths (Holden et al., 2003; Stroul, 2003; Stroul & Friedman, 1986). However, no research to date has addressed children's emotional or behavioral strengths in relation to treatment outcomes. Research in the areas of stress and coping, as well as in resilience and competence, provides some evidence suggesting that children's strengths may contribute to treatment outcome. Transactional models of stress and coping emphasize the role of cognitive appraisals in the stress response, whereby a stress response is initiated when there is an imbalance between an individual's appraised demands and their resources (Lazarus & Folkman, 1984; Matheny, Aycock, Pugh,

Curlette, & Cannella, 1986; McCarthy, Seraphine, Matheny, & Curlette, 2000). Individual differences in resources can account for some of the difference in the stress response. Coping resources have been defined as those psychological, social, and physical strengths that facilitate adaptation to life's demands (Compas, 1987; Matheny et al., 1986). According to the stress-coping model, coping resources play a major role in moderating the effects of stress and thereby affect current and long-term adjustment (Levy-Shiff, Dimitrovsky, Shulman, & Har-Even, 1998). Further, regarding the importance of coping resources, Compas (1987) asserts "the resources available to cope with stress and the manner in which individuals actually cope may be important factors influencing patterns of positive growth and development" (p. 393). Although no published research has addressed coping resources in relation to child therapy outcome, Matheny et al. (1986) suggest coping resources may be an important contributing factor in psychotherapy.

The literature concerning resilience also provides support for the notion that children's behavioral and emotional strengths may impact treatment outcome. The study of resilience attempts to identify various factors that contribute to successful adaptation despite the presence of adversity (Masten et al., 1999; Luthar, Cicchetti, & Becker, 2000). One of the key tenets of resiliency models is that individuals who possess particular competencies or resources are better able to withstand the impact of stressful life circumstances (Masten et al., 1999; Masten & Curtis, 2000; Willis & Filer, 1996). Furthermore, Masten et al. (1999) argue that "the availability of psychosocial resources may counteract or moderate the potentially disruptive influence of adversity" (p. 144).

Consequently, it is likely that children's competencies (i.e. behavioral and emotional strengths) may also influence therapeutic change.

Research has largely neglected indicators of children's strengths or social competencies (Durlak et al., 1995; Kazdin, Bass, et al., 1990). However these variables are related to children's behavioral and emotional adjustment and therefore are likely to contribute to treatment outcome (Kazdin, 1995b). Kazdin (1995b) emphasizes the importance of examining other spheres of functioning stating, "Expanding the domains of assessment can enrich our conclusions about treatment effects and elaborate the different outcome patterns that may result from different treatments" (p. 134). Thus, it seems imperative to explore the role of children's behavioral and emotional strengths in relation to treatment outcomes.

PARENTAL AND FAMILY INFLUENCES

Ecological systems theory asserts that children influence and are influenced by the various contexts in which they exist and that the child's family context is one of the primary sources of influence within the child's environment (Bronfenbrenner, 1979). Family systems theory also contends that the child must be considered within the context of the family system. Wagner and Reiss (1995) state that "the relationships in the family place constraints on the behavior of all family members, such that we cannot understand or predict the behavior of a particular family member by knowledge of his or her individual characteristics in isolation from other family members" (p. 696). For years, clinicians have argued that various parental and family characteristics are related to treatment therapeutic change and have indicated that it should be a high priority in

research to explore how parental and family variables impact treatment response (Kazdin, Siegel et al., 1990; Brannan, 2003). Given the importance of the immediate family environment in the child's life, as well as clinical interest in the family context, it seems necessary to investigate parental and family variables that may play a role in determining treatment outcome.

The study of developmental psychopathology has investigated several family and parental variables that act as risk factors for the development of emotional and behavioral disorders during childhood. Kazdin (1995b) argues that those variables that act as risk factors for the etiology or prognosis of child dysfunction may also contribute to therapeutic outcomes. Family functioning, in particular, has consistently been linked to children's adjustment, as well as various emotional and behavioral problems (Abidin, Jenkins, & McGaughy, 1992; Elgar, Curtis, McGrath, Waschbusch, & Stewart, 2003; Goodyer, Herbert, Tamplin, Secher, & Pearson, 1997; Kazdin, 1995b; Masten et al., 1999; Rutter, 1985).

Given that family functioning is related to children's adjustment, researchers have called attention to the necessity of examining how family functioning may affect treatment outcomes (Brannan, 2003; Durlak & McGlinchey, 1999; Kazdin, 1995b). In a study exploring family predictors of treatment outcome in children with anxiety disorders, Crawford and Manassis (2001) found that family functioning accounted for a significant amount of the variance in clinicians' rating of therapeutic change, such that the greater degree of family dysfunction predicted poorer treatment outcome. Other researchers have obtained similar results supporting the argument that family functioning plays an important role in treatment outcomes in adolescent substance abusers (Friedman

et al., 1995; Phillips et al., 2000) and children with conduct related disorders (Kazdin, 1995a).

There are several possible explanations for the relationship between family dysfunction and poorer treatment outcomes. Durlak and McGlinchey (1999) propose that family dysfunction may hinder treatment progress due to ongoing conflicts in the home. Other researchers suggest that family dysfunctions may maintain the child's dysfunction (Crawford & Manassis, 2001) or may provide obstacles in the delivery of treatment (Kazdin, 1995b). Regardless of the possible reasons, family functioning is likely an important predictor of therapeutic change and should be examined further to extend the generalizability of the above findings to other populations.

Parental functioning also has important implications for children's adjustment (Abidin et al., 1992; Cicchetti, 1994; Elgar et al., 2003; Kazdin, 1995b). Parental psychopathology has been linked to adverse child outcomes, including emotional and behavioral disturbances (Billings & Moos, 1986; Elgar, et al., 2003). Parental stress has also been found to play a role in children's emotional and behavioral functioning (Abidin et al., 1992) and has been associated with poorer treatment outcomes (Crawford & Manassis, 2001; Kazdin, 1995a; Kazdin & Crowley, 1997).

One possible explanation for the relationship between parental functioning and poorer child outcomes is that parental stress detrimentally affects parental emotional availability and quality of caregiving, which in turn impairs the parent-child relationship (Abidin et al., 1992; Crawford & Manassis, 2001; Elgar, 2003; Manassis & Hood, 1998; Target & Fonagy, 1994). Parental availability plays a crucial role in children's ability to handle adversity (Willis & Filer, 1996). Given that parental stress has adverse

consequences for the parent-child relationship as well as the child's ability to cope with adversity, it seems likely that it may impact treatment outcomes. Although research has failed to clarify the exact role of parental functioning on treatment outcomes, these lines of research provide support for the inclusion of parental and family characteristics as predictors of child therapy outcome.

Due to the bi-directional nature of parent-child relationships (Bronfenbrenner, 1979), the unique demands of caring for a child with serious emotional and/or behavioral problems will likely contribute to parental stress. Caring for a child with emotional and/or behavioral problems is a particularly stressful task for parents and families and likely contributes to caregiver burden, a unique form of parental stress (Angold et al., 1998; Brannan & Heflinger, 2001; Brannan, Heflinger, & Bickman, 1997). Caregiver strain has been defined as the "demands, responsibilities, difficulties, and negative psychic consequences of caring for relatives with special needs" (Brannan, et al., 1997, p. 212). Considering the research regarding the detrimental effects of parental stress on the quality of caregiving (Abidin et al., 1992; Crawford & Manassis, 2001), caregiver strain will likely also impair parental availability and consequently the parent-child relationship. The impact of caregiver strain on clinical and functional outcomes should, therefore, be examined.

SUMMARY

It is evident that in order to obtain a more complete understanding of differences in clinical and functional outcomes for youth within systems of care, and to better provide effective services to children with serious emotional and behavioral disorders,

research must address psychosocial and contextual variables that may play a predictive role in such outcomes over time. A strengths-based perspective is a key component of the system of care approach (Stroul 2003; Stroul & Friedman, 1986). Despite exploring changes in behavioral and emotional strengths over time, researchers have yet to examine the role these strengths may play in explaining differences in clinical and functional outcomes over time for children with serious emotional disturbances who participate in system of care services. Exploring children's behavioral and emotional strengths in relation to clinical and functional outcomes is not only consistent with a strengths perspective, but it also provides useful information regarding possible avenues for improving service interventions and more broadly, may facilitate a better understanding of the process of treatment. It may be that the individual strengths and resources children bring with them when they enter system of care services can be further enhanced through specific interventions. It is also possible that by identifying those children who are more likely to respond to therapy, clinicians could design interventions to bolster children's behavioral and emotional strengths in therapy, thereby facilitating better treatment outcomes, not only within systems of care, but also more broadly, in more traditional community mental health service interventions. Identifying those factors that may be related to poorer treatment response rate can permit clinicians to specifically intervene and target those areas of risk (e.g. greater caregiver strain and poorer family functioning) for each child, possibly further improving clinical and functional outcomes.

Thus, this dissertation study seeks to explore the relationship between children's behavioral and emotional strengths and differences in clinical and functional outcomes over time for children participating in system of care services. In addition, given the

important role of the family in a child's life (Bronfenbrenner, 1979), this study also investigates the role of family functioning and caregiver strain in predicting differences in clinical and functional outcomes over time within systems of care. Demographic variables (age, sex, and race) are also included as possible predictor variables in clinical and functional outcomes for youth within systems of care.

Chapter 3: Methodology

RESEARCH AIM

Given the demands inherent in a managed care approach to mental health treatment, there has been an increasing focus on developing and utilizing effective, short-term, empirically validated interventions (Ollendick & Russ, 1999). Research has emphasized the deficiencies of fragmented mental health services which are typical in many community settings calling for major system reform to enhance therapeutic services to children who are seriously emotionally disturbed (Stroul & Friedman, 1986). Stroul and Friedman (1986) outlined a philosophical framework of a system of care approach to facilitate the development and delivery of comprehensive, community-based mental health services to children and their families. The system of care paradigm calls for children's mental health services to be comprehensive, community-based, individualized, and culturally competent (Stroul & Friedman, 1986). The system of care philosophy has played a major role in organizing the development of community based mental health services for children and their families (Holden et al., 2001).

To date, there has been much research evaluating systems of care and determining the effectiveness of such an integrated, community based system-wide approach to service delivery for children with serious emotional disturbances. In general the results broadly suggest that the system of care approach to community mental health services leads to improved clinical and functional outcomes over time for children with serious

emotional disturbances (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden, et al., 2001; Holden et al., 2003; Manteuffel et al., 2002). However, as the effectiveness of any given clinical intervention will be influenced by an array of individual characteristics the child brings with him or her when he or she begins therapy (Kazdin, 1995b; Kazdin & Wassell, 1999; Phillips et al., 2000), research must also address the factors that can predict differential clinical and functional outcomes within systems of care. No available research has explored the predictive role of behavioral and emotional strengths or family and parental functioning on clinical and functional outcomes within systems of care. In addition, there have been inconclusive results regarding the best predictors of treatment outcomes in the broad field of child psychotherapy.

The primary purpose of this dissertation is to examine the contribution of children's behavioral and emotional strengths in relation to clinical and functional outcomes over time for children with serious emotional disturbances who receive system of care services. In addition, due to the importance of the child's family context (Bronfenbrenner, 1979), this study examined the role of parental and family variables to clinical and functional outcomes over time. This study also explored the impact of selected demographic variables, including children's age, sex, and race, on changes in clinical and functional status over time given that there have been inconsistencies regarding the usefulness of including such variables (Barkley et al., 1992; Casey & Berman 1985; Center for Mental Health Services, 1999; Kazdin & Crowley 1997; Kazdin & Wassell, 2000; Manteuffel et al., 2002; Phillips et al., 2000; Target & Fonagy, 1995; Weisz et al, 1987; Weisz et al., 1995).

PARTICIPANTS

Participants for the current study were selected from those children and families who participated in the Child and Family Outcomes Study of the national evaluation of the Comprehensive Community Mental Health Services for Children and Their Families Program. As described previously, this program provides federal grant money to communities to develop and evaluate comprehensive systems of care for mental health services for children with serious emotional disturbances. A total of 96 grants have been provided and over 50,000 children and their families have received some type of services from these grant communities (Holden et al., 2003).

As described previously, there were five major components of the national evaluation, each examining different aspects of systems of care: System of Care Assessment, Cross-sectional Descriptive Study, Services and Cost Study, Longitudinal Comparison Study, and Child and Family Outcomes study. The program and national evaluation were conducted in multiple phases. Phase I consisted of grant communities who received funding in 1993 and 1994. Phase II consisted of twenty-three grant communities who received funding in 1997 and 1998. Phase III consisted of 22 grantee communities who received funding in 1999 and 2000.

Limited data were collected during Phase I of the national evaluation. During Phase II of the national evaluation, the assessment protocol was revised and included the measures used in current study (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003). This revised assessment protocol was also used in Phase III of the evaluation. Consequently, only data from the Child and Family Outcomes Study

collected during Phase II and Phase III of the national evaluation were used in the current study.

Children and adolescents with serious emotional disturbances, who were between the ages of birth to twenty-one years old, and who currently have or within the last year have had, a diagnosable mental, emotional, or behavioral disorder consistent with the Diagnostic and Statistical Manual of Mental Disorder (DSM-IV; American Psychiatric Association, 1994) were eligible for participation in the national evaluation (Center for Mental Health Services, 1998; 1999; 2000; 2001). Though there has been ongoing debate regarding the definition of mental disorders in children, in 1993 the Federal Register posed the following definition which has been used in the national evaluation: "children with serious emotional disturbances are persons from birth to age 18 who currently, or at any time during the past year have had a diagnosable mental, behavioral, or emotional disorder of sufficient duration to meet diagnostic criteria specified within DSM-III-R, that resulted in functional impairment that substantially interferes with or limits the child's role or functioning in family school, or community" (as cited Duchnowski, Kutash, & Friedman, 2002, p. 19). Given the age limits on the instruments used in this particular study, only children between the ages of 7 and 18 years old at the time of entry into system of care services were included in the current analyses. As described previously, each child participating in the system of care likely received a different combination of services to meet his or her unique needs and level of functioning (Stroul, 2003).

PROCEDURE

As mentioned above, only data from the Child and Family Outcomes Study during Phase II and Phase III were used in this study. The goal of the Child and Family Outcomes Study of the national evaluation is to examine how systems of care impact clinical and functional status over time. During Phase I of the evaluation, children and families were assessed at initiation into services, at six months, one year, and annually thereafter for up to thirty-six months as long as the child remained in services. Children and their families participating in the Child and Family Outcomes Study during Phases II and III were assessed initially at intake into services and then again every six months for up to thirty-six months. Children and families were followed regardless of whether they remained in services (Center for Mental Health Services, 1998; 1999; 2001; Holden et al., 2003).

The following is a general overview of the typical procedures for data collection across the various community grantee sites. There were general national procedures for data collection; however, there was some flexibility in these procedures so that each community could carry out the evaluation to meet its needs and available resources. Initially, the caregivers were interviewed to obtain descriptive information to determine eligibility for participation. In some cases, this data was obtained from questionnaires completed by case workers based on the intake records. After eligible caregivers gave informed consent, either trained data collectors or case workers conducted baseline interviews with the caregivers and adolescents 11 years old and older (Manteuffel et al., 2002). Additional baseline data was also collected at this time (e.g. CBCL, BERS, FAD, CGSQ, etc.) (Center for Mental Health Services, 1999). The initial CAFAS was

completed by raters who were trained to assess a child's level of functioning during this time. Most often, the CAFAS was completed by clinicians who obtained the necessary information from children, caregivers, school records and official records or by information obtained from structured caregiver interviews (Manteuffel et al., 2002). Follow-up CBCL, YSR, BERS, FAD, and CGSQ were administered each time either in the clinical setting or during the follow-up interview. The follow-up CAFAS was completed each time by raters who were familiar with the children (Center for Mental Health Services, 1999; Holden et al., 2003; Manteuffel et al., 2002). Table 1 provides an overview of the measures and timeframes used in the current analyses.

INSTRUMENTS

Child Predictor Variables

Behavioral and Emotional Rating Scale (BERS)

The Behavioral and Emotional Rating Scale (Epstein & Sharma, 1998) is a nationally normed, 52-item checklist designed to be completed by caregivers or professionals (for example teachers). The BERS requires raters to have at least sixth-grade reading level and takes approximately ten minutes to complete. The BERS assesses a variety of personal behavioral and emotional strengths across several domains for children between the ages of 5 to 18. Each item on the BERS is rated on a four-point scale of 0 to 3 (0 = Not at all like the child; 1 = Not much like the child; 2 = Like the child; and 3 = Very much like the child). The instrument yields an overall Strength Quotient and five factor analytically derived subscales of behavioral and emotional strengths. The Interpersonal Strength (IS) subscale assesses the child's ability to interact

Table 1

Summary of Measures and Collection Times Used in Analyses.

Instrument	Abbreviation	Collection Time in Analyses
Predictor Variables:		
1. Behavioral and Emotional Rating Scale – Strength Quotient	BERS-SQ	Intake
2. Caregiver Strain Questionnaire – Global Strain Score	CGSQ-GS	Intake
3. Family Assessment Device – General Functioning Score	FAD-GF	Intake
4. Demographic Information Age Sex Race		Intake
Outcome Variables:		
1. Child Behavior Checklist – Total Problems Score	CBCL	Intake 6 months 12 months 18 months 24 months
2. Child and Adolescent Functional Assessment Scale – Total Score	CAFAS	Intake 6 months 12 months 18 months 24 months

with others and control his or her emotions and behaviors in social situations. The Family Involvement (FI) subscale examines the child's participation in and relationship with his or her family members. The Intrapersonal Strength (IaS) subscale captures the child's view of his or her own accomplishments and competence. The School Functioning (SF) subscale examines the child's competence in school and classroom tasks. The Affective Strength (AS) subscale refers to the child's ability to express feelings towards others and accept affection from others. A raw score for each of the five subscales is obtained by summing the ratings for the items that make up the subscale. Subscale raw scores are then converted into standard scores and percentiles. The overall Strength Quotient is obtained by combining the five subscale standard scores which can then be converted to a standard score with a mean of 100 and a standard deviation of 15. Only the overall Strength Quotient (BERS-SQ) was used in the current study.

The BERS was designed to be used primarily in the areas of special education, child welfare, and child mental health to help identify treatment goals or areas for intervention (Canino, Costello, & Angold, 1999). It has also been suggested that the BERS is a useful outcome measure to assess progress in the development of particular strengths as a result of intervention or specialized services (Epstein & Sharma, 1998). The BERS has been used extensively in the system of care national evaluation (Holden et al., 2003).

The BERS has satisfactory test-retest reliability and inter-rater reliability. Epstein, Harness, Pearson, and Ryser (1999) reported one week test-retest reliability coefficients ranging from .85 to .99. The study also revealed high rates of consistency between raters with coefficients ranging from .83 to .98. Epstein and Sharma (1998)

reported strong internal consistency reliability with all coefficient alphas above .80, and about half above .90 for both a sample of children not identified with emotional or behavioral disorders (NEBD) as well as a sample of children who were diagnosed with an emotional or behavioral disorder (EBD). To demonstrate the concurrent validity, Harniss, Epstein, Ryser, & Pearson (1999) compared the BERS and the Walker-McConnell Scale of Social Competence and School Adjustment. Correlation coefficients were moderate to high across all the subscales and were in the expected directions, ranging from .29 and .85, providing evidence for concurrent validity. Epstein et al., (2002) examined the convergent validity of the BERS with two measures used to identify behavioral and emotional disturbances in children (the Systematic Screening for Behavior Disorders (SSBD) and Scale for Assessing Emotional Disturbance (SAED). The authors found moderate to strong correlations between the BERS and the SSBD ranging from -.263 to -.798 and moderate to strong correlations between the BERS and the SAED ranging from .426 to .714, which the authors concluded as supporting the convergent validity of the BERS. Trout, Ryan, La Vagne, and Epstein (2003) also investigated the convergent validity of the BERS with a sample of kindergarten children. Similar to previous validity studies, the authors found low to high correlations between the BERS and the competency scales from Teacher Report Form (TRF) of the CBCL (ranging from .298 to .730) and low to high negative correlations on the TRF externalizing, internalizing, and total problem subscales (-.227 to -.615).

Parental and Family Predictor Variables

Caregiver Strain Questionnaire (CGSQ)

The Caregiver Strain Questionnaire (Brannan et al., 1997) is a 21-item self report measure designed to assess the extent to which caregivers are affected or strained by the special demands associated with caring for a child with serious emotional and behavioral disturbances. Each item is rated on a five point Likert-type scale ranging from 1 (not at all a problem) to 5 (very much a problem). CGSQ yields a Global Strain score and the following three factor analytically derived subscale scores: Objective Strain, Subjective-externalized Strain, and Subjective-internalized Strain. The Objective Strain subscale examines the extent to which observable negative events related to the child's disorder have been problematic for the family, such as interruption of work or personal time, trouble with neighbors, financial strain, etc. The Subjective-externalized Strain subscale measures the caregivers negative feelings directed at the child such as anger, embarrassment, or resentment. The Subjective-internalized Strain subscale assesses the negative feelings that the caregiver experiences associated with caring for a child with psychological problems such as worry, sadness, guilt, or fatigue. Only the Global Strain (CGSQ-GS) score, which provides a measure of the total impact on the family, was used in this study.

Brannan et al. (1997) provided reliability and validity information for the CGSQ. They reported moderate to high intercorrelations among the three subscales which they conclude indicates the existence of three separate but related dimensions of caregiver strain. The CGSQ displayed acceptable internal consistency reliability with coefficient alphas ranging from .74 to .92 for the subscales and a coefficient alpha of .93 for the

entire scale. Brannan et al. (1997) examined the convergent validity of the CGSQ by comparing it to other measures of parental and family functioning. As expected they found low correlations (ranging from -.069 to -.297) with family functioning and a moderate relationship (ranging from .220 to .423) with parental distress.

Family Assessment Device (FAD)

The Family Assessment Device (Epstein, Baldwin, & Bishop, 1983) is a 60-item self-report instrument designed to be completed by both the caregiver and family members over 12 years old. The FAD assesses family functioning and provides a measure of how families interact, communicate, and work together. Each item on the FAD is rated on a four-point scale from 1 (Strongly disagree) to 4 (Strongly agree). The FAD yields scores across seven domains of family functioning: Problem Solving, which measures the families ability to resolve problems; Communication, which examines the exchange of information among family members; Roles, which assess the patterns of behavior which support key family functions; Affective Responsiveness, which assesses the extent to which family members experience appropriate affect with one another; Affective Involvement which measures the extent to which family members are interested in each others activities and concerns; Behavior Control, which assesses the ways in which families express and maintain standards of behavior for family members; and General Functioning, which provides a measure of the family's overall health and functioning. Only the General Functioning (FAD-GF) score obtained from caregivers was used in the current study.

The FAD was developed in the early 1980's and is one of the most widely used self-report measures of family functioning. It is considered to be a well established,

psychometrically sound instrument (Sawin, Harrigan, & Woog, 1995). The authors reported internal consistency reliabilities for each of the subscales ranging from .72 (Behavior Control) to .92 (General Functioning) (Epstein et al., 1983). The authors also provided evidence for validity suggesting that the FAD is useful for discriminating psychiatric and non-clinical families. Miller, Epstein, Bishop, and Keitner (1985) reported test-retest reliabilities ranging from .66 to .76. Miller et al. (1985) examined the concurrent validity comparing the FAD to other measures of family functioning and found correlations ranging from .30 to .75.

Outcome Measures

Child Behavior Checklist (CBCL)

The Child Behavior Checklist (Achenbach, 1991a) is a widely used, well researched and psychometrically sound instrument (McConaughy, 1993). The CBCL has been used extensively in research as a measure of emotional and behavioral functioning for children and adolescents (Kazdin, 1995a). It is a nationally normed instrument completed by caregivers and is designed to evaluate competencies and emotional and behavioral problems in children ages 4-18. The CBCL contains 20 competence items that make up three competence subscales (Activities, Social interactions, and School) and a Total Competence score. Scores on the competence scales were not used. The CBCL also contains 118 problem behavior items that yield eight narrowband syndrome scales (Withdrawn, Somatic Complaints, Anxious/Depressed, Social Problems, Thought Problems, Attention Problems, Delinquent Behavior, and Aggressive Behavior), two broadband scales (Internalizing and Externalizing), and a Total Problems scale. Each of

the 118 problem behavior items is rated on a three-point scale from 0 (Not true) to 2 (Very true or often true). Raw scores for the Total Problems scale are obtained by summing each of the items that make up the scale. Raw scores are then converted into normalized T-scores ranging from 23 to 100, with scores under 60 below the clinical range, scores between 60 and 63 in the borderline range, and scores greater than 63 in the clinical range. Consistent with other studies of treatment outcomes (see Kazdin, 1995; Kazdin & Crowley, 1997) only the Total Problems scale was used in the current study.

For boys and girls ages 4-11 and ages 12-18, Total Problems coefficient alphas were .96 (Achenbach, 1991a). The CBCL also demonstrates satisfactory one week test-retest reliability on the problem scales ranging from .82 to .95, with an average of .89 across groups and problem scales (McConaughy, 1993). Principle component analysis, comparison with other instruments, and discriminant function analysis were used to assess the validity of the CBCL (Achenbach, 1991a).

Child and Adolescent Functional Assessment Scale (CAFAS)

The Child and Adolescent Functional Assessment Scale is the most widely used measure of functional impairment for children and adolescents (Canino et al., 1999). Hodges (as cited in Bates, 2001) developed the CAFAS which is a multidimensional measure of functional impairment for children and adolescents between the ages of 6-17. The CAFAS was designed to be completed by clinicians or other trained administrators and takes approximately ten minutes to complete. However in the national evaluation, information to complete the CAFAS was obtained primarily through structured interviews with the child's caregiver (Center for Mental Health Services, 1998; 1999; 2000; 2001). The CAFAS rater assesses the child's level of functional impairment by

reviewing a list of 165 behavioral descriptions across levels of severity in each of the eight domains of impairment. The CAFAS is rated on four levels of impairment: 0 = Minimal or no impairment; 10 = Mild impairment; 20 = Moderate impairment; and 30 = Severe Impairment. The rater assigns the most severe level of functioning for which the child qualifies. The CAFAS provide eight subscale scores across the eight domains of functioning: School Role, which assesses the child's ability to fulfill school role such as attendance rate, quality of academic work, etc; Home Role, which examines the child's ability to behave appropriately at home, such as general obedience; Community Role, which examines the child's delinquency and negative behaviors on other people or their property; Behavior Towards Others, which rates the appropriateness of the child's daily behavior; Moods/Emotions, which measures the child's emotions related to trauma, stress, anxiety, and depression; Self-harm Behaviors, which rates behaviors intended to harm oneself; Thinking, which assesses the child's ability to think rationally; and Substance Use, which rates the child's substance use and extent to which it impairs functioning. Each of the subscale scores is summed to yield a Total Score ranging from 0 to 240. Total scores below 40 indicate minimal impairment, scores from 50-90 indicate moderate impairment, scores between 100 and 130 indicated marked impairment, and scores greater than 140 suggest severe impairment (as cited in Bates, 2001). Consistent with other studies evaluating functional outcomes within the system of care (Center for Mental Health Services, 1998; 1999; 2001; Holden et al., 2003; Manteuffel et al., 2002), only CAFAS Total scores were used in the current study.

Hodges (as cited in Bates, 2001) reported internal consistency reliabilities, using Cronbach's alpha, ranging from .63 to .68. Hodges and Wong (1996) reported

satisfactory inter-rater reliability ranging from .74 to .99. Concurrent validity has been assessed by comparing the CAFAS to other measures of functional impairment. Pearson correlations between the CAFAS and the Children's Global Assessment Scale were moderate to strong, ranging from -.72 to -.91 (Bates, 2001). Hodges and Wong (1996) also report criterion and predictive reliability.

DATA ANALYSIS

Latent variable quadratic growth curve modeling, utilizing a hierarchical linear modeling (HLM) approach (Raudenbush & Bryk, 2002) was conducted to explore changes in clinical and functional outcomes over time. This analytic strategy was also used to examine the relationship between the predictor variables (behavioral and emotional strengths, family functioning, caregiver strain, children's age, sex, and race) and differences in individual growth trajectories (i.e., change over time) on measures of clinical and functional outcomes over time. Hierarchical linear modeling, also known as multilevel modeling, approaches are useful when data structures are hierarchically organized or nested. Growth curve modeling, employing such an approach, is a special case where multiple observations are considered to be nested within persons, thus repeated measures are nested within individuals (Francis, Schatschneider, & Carlson, 2000; Raudenbush & Bryk, 2002).

A multilevel approach to measuring change over time offers a number of advantages over other more traditional analytic methods of change over time such as repeated measures ANOVA or MANOVA. More traditional approaches of analyzing change over time look at changes in mean performance and do not model individual

change, whereas multilevel growth curve models assume that growth is a process rather than a series of starts and stops. In addition, multilevel approaches provide a growth curve for each individual, thus allowing researchers to explore variability in individual rates of change (Francis et al., 2000).

Another advantage of multilevel modeling is that it does not require a complete set of outcomes for each individual, and thus it permits missing data points on the dependent measures. Moreover, a multilevel approach to growth curve modeling can simultaneously measure not only change over time, but also individual characteristics that predict variability in individual growth rates (Francis et al., 2000; Raudenbush & Bryk, 2002). Highlighting the applicability of a multilevel approach to measuring change over time, Raudenbush and Bryk (2002) state, "the development of hierarchical linear models has created a powerful set of techniques for research on individual change. [T]hese models afford an integrated approach for studying the structure and predictors of individual growth" (p. 161).

For the current study a two-level model was conducted for each of the outcome measures (i.e., the CBCL Total Problems Score and CAFAS Total Score, respectively). Inspection of the scatter plots depicting individual growth trajectories suggested nonlinear growth patterns and thus quadratic models were used. The Level 1 models provide individual growth trajectories, as well as an estimate of the variability of the outcome scores around an individual growth curve. The Level 2 models provide an estimate of the variability of the growth curves across individuals due to the impact of the predictor variables included in the models. Both unconditional and conditional models were employed. Unconditional models have no predictors in the model at Level 2, and

thus provide individual and average estimates of change over time, as well as variability in growth rates. Conditional models include predictor variables in the Level 2 model and thus predict variability in growth rates according to individual characteristics. The Level 2 predictor variables examined in the analyses were as follows: age, sex, race, BERS-SQ (Strength Quotient), CGSQ-GS (Global Strain), and FAD-GF (General Functioning). In the models predicting the growth parameters, in order to account for or adjust for differences in rates of change due to initial levels of functioning, the child's predicted initial status, the latent variable, on measures of clinical and functional impairment was also added in the Level 2 model as a predictor of change over time (see Raudenbush & Bryk, 2002; Seltzer, Choi, & Thum, 2003).

Five measurements (intake and every six months for up to twenty-four months) were collected on each outcome measure, providing estimates of the parameters in the Level 1 model describing initial status and the growth trajectories. The time metric was coded such that the intercept reflected initial levels of clinical and functional impairment (Intake = 0; 6 months = 1; 12 months = 2; 18 months = 3; and 24 months = 4). In the Level 2 models, all the continuous variables were centered around their respective grand means. This approach to centering variables allows for more meaningful interpretations of the intercept value (Raudenbush & Bryk, 2002). Consistent with other systems of care studies, the race variable was dichotomized into white/non-white categories. Dichotomous predictor variables (sex and race) were dummy coded (0 = Male; 1 = Female; 0 = non-white, Hispanic, Multiracial; 1 = White, non-Hispanic) and were entered into the Level 2 models uncentered.

GROWTH CURVE MODELS

The following models were used to examine differences in initial level of clinical and functional impairment (initial status) and individual growth rates on measures of clinical and functional outcomes, as well as the individual characteristics that predict differences in initial status and growth rates. The same models were used for measures of clinical and functional status (CBCL and CAFAS).

Unconditional Models

Level 1

$$Y_{ti} = \pi_{0i} + \pi_{1i}(\text{TIME})_{ti} + \pi_{2i}(\text{TIME}^2)_{ti} + e_{ti} \quad (1)$$

The time metric was centered such that Intake = 0; 6 months = 1; 12 months = 2; 18 months = 3; and 24 months = 4. In order to model nonlinear (quadratic) growth across time, the time variable was squared and entered into the model. Thus, π_{0i} is the predicted (latent) initial status (either CBCL or CAFAS) at intake, π_{1i} is the instantaneous growth rate, π_{2i} is the curvature or deceleration in each growth trajectory, and e_{ti} are the residuals, which are assumed to be normally distributed with a mean of 0 and a constant variance, σ^2. An estimation for latent initial status (π_{0i}) and the growth parameters (π_{1i} and π_{2i}) are calculated for each individual.

Level 2

$$\pi_{0i} = \beta_{00} + r_{0i} \quad (2)$$

$$\pi_{1i} = \beta_{10} + r_{1i} \quad (3)$$

$$\pi_{2i} = \beta_{20} + r_{2i} \quad (4)$$

Because this is the unconditional model, no explanatory variables appear in this level 2 model. Thus, β_{00} is the average initial status (either CBCL or CAFAS), β_{10} is the average instantaneous growth rate, β_{20} is the average rate of deceleration, and $r_{0i,}$ $r_{1i,}$ and r_{2i} are residual terms. R_{0i} represents the deviation of an individual's latent initial status around the average initial status, r_{1i} captures the deviation of an individual's instantaneous growth rate around the average instantaneous growth rates, and r_{2i} captures the deviation of an individual's rate of deceleration around the average deceleration rate. Residual terms ($r_{0i,}$ $r_{1i,}$ and r_{2i}) are assumed to be normally distributed with a mean of 0 with variance $\tau_{00,}$ τ_{11}, and τ_{22}, respectively and covariances $\tau_{01,}$ $\tau_{02,}$ and τ_{21}. The Level 2 model, therefore, provides an estimation of the average initial status (β_{00}), average instantaneous growth rate (β_{10}), and average rate of deceleration (β_{20}) for the entire sample as well as the variance of the parameters reflecting the individual growth trajectories around the sample average.

Latent Variable Conditional Models

Latent (predicted) initial status is included as a predictor in the model as it seems reasonable to conclude that initial status and subsequent growth rates will be strongly related. Including latent initial status in the Level 2 model permits comparisons of growth parameters (instantaneous growth and deceleration rates) in a way that adjusts for differences in initial status (see Raudenbush & Bryk, 2002; Seltzer et al., 2003). The Level 1 model remains the same throughout, and thus interpretation for each of the parameters (π_{0i}, π_{1i}, π_{2i}, and e_{ti}) remains the same as above (see Equation 1).

Level 2

$$\pi_{0i} = \beta_{00} + \beta_{01}(AGE)_i + \beta_{02}(SEX)_i + \beta_{03}(BERS\text{-}SQ)_i + \beta_{04}(CGSQ\text{-}GS)_i + \beta_{05}(FAD\text{-}GF)_i + \beta_{06}(RACE)_i + r_{0i} \quad (5)$$

$$\pi_{1ij} = \beta_{10j} + \beta_{11}(AGE)_i + \beta_{12}(SEX)_i + \beta_{13}(BERS\text{-}SQ)_i + \beta_{14}(CGSQ\text{-}GS)_i + \beta_{15}(FAD\text{-}GF)_i + \beta_{16}(RACE)_i + b_{17}(\pi_{0i}) + r_{1i} \quad (6)$$

$$\pi_{2ij} = \beta_{20j} + \beta_{21}(AGE)_i + \beta_{22}(SEX)_i + \beta_{23}(BERS\text{-}SQ)_i + \beta_{24}(CGSQ\text{-}GS)_i + \beta_{25}(FAD\text{-}GF)_i + \beta_{26}(RACE)_i + b_{27}(\pi_{0i}) + r_{2i} \quad (7)$$

Due to grand mean centering of all continuous explanatory variables, β_{00} is the expected initial status for non-white males when all other continuous variables (age, BERS-SQ, CGSQ-GS, and FAD-GF) in the model are at their respective means, β_{01} is the effect of age on initial status (either CBCL or CAFAS) controlling for all other predictor variables in the model, β_{02} is the effect of sex on initial status controlling for all other predictor variables in the model, β_{03} is the effect of the BERS on initial status controlling for all other predictor variables in the model, β_{04} is the effect of caregiver strain on initial status controlling for all other variables in the model, β_{05} is the effect of family functioning on initial status controlling for all other variables in the model, β_{06} is the effect of race on initial status controlling for all other variables in the model, and $b_{17}(\pi_{0i})$ is the effect of latent initial status on either the CBCL or CAFAS on instantaneous growth rates controlling for all other predictor variables. β_{10j} is the expected instantaneous growth rate for non-white males when all other continuous variables (age, BERS, CGSQ, and FAD) in the model are at their respective means, β_{11} is the effect of age on instantaneous growth rates controlling for all other predictor variables in the model, β_{12} is the effect of

sex on instantaneous growth rates controlling for all other predictor variables in the model, β_{13} is the effect of the BERS on instantaneous growth rates controlling for all other predictor variables in the model, β_{14} is the effect of caregiver strain on instantaneous growth rates controlling for all other variables in the model, β_{15} is the effect of family functioning on instantaneous growth rates controlling for all other variables in the model, and β_{16} is the effect of race on instantaneous growth rates controlling for all other variables in the model. β_{20j} is the expected rate of deceleration for non-white males when all other continuous variables (age, BERS-SQ, CGSQ-GS, and FAD-GF) in the model are at their respective means, β_{21} is the effect of age on rate of deceleration controlling for all other predictor variables in the model, β_{22} is the effect of sex on rate of deceleration controlling for all other predictor variables in the model, β_{23} is the effect of the behavioral and emotional strengths on rate of deceleration controlling for all other predictor variables in the model, β_{24} is the effect of caregiver strain on rate of deceleration controlling for all other variables in the model, β_{25} is the effect of family functioning on rate of deceleration controlling for all other variables in the model, β_{26} is the effect of race on rate of deceleration controlling for all other variables in the model, and $b_{27}(\pi_{0i})$ is the effect of latent initial status on either the CBCL or CAFAS on rate of deceleration controlling for all other predictor variables. The residual terms are $r_{0i,}$ r_{1i}, and r_{2i}, and as above, have a mean of 0 and variance $\tau_{00,}$ τ_{11}, and τ_{22}, respectively, and covariances $\tau_{01,}$ $\tau_{02,}$ and τ_{21}.

RESEARCH QUESTIONS AND STUDY HYPOTHESES

Research Question 1: Children's Emotional and Behavioral Strengths and Clinical and Functional Status

The first research question examines the relationship between children's behavioral and emotional strengths and change in clinical and functional outcomes over time, as well as clinical and functional status at intake into system of care services. Are children's behavioral and emotional strengths measured at intake predictive of changes in clinical and functional outcomes over time for children receiving system of care services? Does children's clinical and functional status at intake differ as a function of their behavioral and emotional strengths?

Hypothesis 1a

Children's behavioral and emotional strengths will significantly predict differences in growth rates on measures of clinical and functional outcomes for children with serious emotional disturbances who receive services in systems of care. Those children possessing greater behavioral and emotional strengths at intake will demonstrate better growth rates on measures of clinical and functional outcomes as measured by change over time on the CBCL and CAFAS, respectively.

Hypothesis 1b

Children's behavioral and emotional strengths will also be significantly predictive of initial levels of clinical and functional impairments for children with serious emotional disturbances who receive services in systems of care. Ratings of initial clinical and functional impairments as measured by the CBCL and CAFAS respectively, will be lower among children possessing greater levels of behavioral and emotional strengths.

Rationale

No published research has addressed the predictive role of children's behavioral and emotional strengths in relation to clinical and functional outcomes over time within systems of care. However, research has highlighted the important role of children's strengths in predicting adaptive functioning (Epstein, 1999; Epstein et al., 2002). Coping resources, which are related to children's strengths, have also been linked to positive adjustment (Compas, 1987; Levy-Shiff et al., 1998), and have been suggested to play a role in treatment outcomes (Matheny et al., 1986). Additionally, models of resilience assert that psychosocial resources and competencies facilitate an individual's ability to withstand stressful life events and overcome adversity (Luthar et al., 2000; Masten et al., 1999; Masten & Curtis, 2000; Willis & Filer, 1996). Moreover, previous system of care research has demonstrated that at intake into system of care services, children's behavioral and emotional strengths were negatively correlated with their functional impairment as measured by the CAFAS. Thus, at intake into services, those children with greater levels of functional impairment possessed fewer behavioral and emotional strengths (Center for Mental Health Services, 1999; 2000; 2001).

Research Question 2: Caregiver and Family Variables and Clinical and Functional Status

The second research question explores the relationship between parental and family functioning and change in clinical and functional outcomes overtime, as well as clinical and functional status at intake into system of care services. Is family functioning measured at intake predictive of differences in clinical and functional outcomes over time for children with serious emotional disturbances who receive system of care services? Is

caregiver strain measured at intake predictive of differences in clinical and functional outcomes over time for children with serious emotional disturbances who receive system of care services? Does children's clinical and functional status at intake differ as a function of level of family functioning and caregiver strain?

Hypothesis 2a

It is hypothesized family functioning and caregiver strain will predict differences in growth rates on measures of clinical and functional outcomes for children with serious emotional disturbances who receive services in systems of care. Greater family dysfunction and greater caregiver strain at intake into services will demonstrate poorer growth rates on measures of clinical and functional outcomes as assessed by change over time on the CBCL and CAFAS respectively.

Hypothesis 2b

Consistent with previous findings (Center for Mental Health Services, 2000; 2001), it is also expected that there will be a significant relationship between family functioning and caregiver burden and initial levels of clinical and functional impairments for children with serious emotional disturbances who receive services in systems of care. Children with greater levels of clinical and functional impairments at intake will display greater levels of family dysfunction and caregiver strain.

Rationale

Many researchers have underscored the important influence of parents and family on child outcomes (Abidin, et al., 1992; Bronfenbrenner 1977; 1979; Elgar et al., 2003; Kazdin, 1995a; Masten et al., 1999; Rutter, 1985; Wagner & Reiss, 1995). Previous research has linked family functioning to treatment outcomes for a variety of childhood

mental health concerns including anxiety disorders (Crawford & Manassis, 2001), adolescent depression (Goodyer et al, 1997), disruptive behavior disorders (Kazdin, 1995a), and substance abuse (Friedman et al., 1995; Phillips et al., 2000). Due to the bidirectional nature of parent-child relationships (Bronfenbrenner, 1979), the unique demands of caring for a child with serious emotional and/or behavioral problems can be particularly stressful for parents and families and likely contributes to caregiver strain, a form of parental stress (Angold et al., 1998; Brannan et al, 1997). Parental stress in general has been found to play a role in children's behavioral and emotional outcomes (Abidin et al., 1992) and has been associated with poorer treatment outcomes (Crawford & Manassis, 2001; Kazdin, 1995a; Kazdin & Crowley, 1997). Data from systems of care research has suggested that family functioning, as well as caregiver strain, is significantly correlated with measures of both clinical and functional impairment at intake into system of care services. Greater family dysfunction at intake was related to greater levels of internalizing and externalizing problems on the CBCL. Poorer family functioning at intake was also was associated with greater levels of functional impairment on the CAFAS at intake. Similar to levels of family functioning, greater caregiver strain at intake was associated with both greater internalizing and externalizing problems on the CBCL and greater functional impairment on the CAFAS at intake (Center for Mental Health Services, 2000; 2001).

Research Question 3: Demographic Variables and Clinical and Functional Status

The third research question explores the relationship between children's demographic variables and change in clinical and functional outcomes over time, as well as clinical and functional status at intake into system of care services. Is there a

relationship between children's age, sex, and race and changes in clinical and functional outcomes over time for children receiving system of care services? Is there a relationship between children's demographic variables (age, sex, and race) and clinical and functional impairments at intake into services?

Hypothesis 3a

It is expected that there will be an effect of age and sex on growth rates on measures of clinical and functional outcomes for children with serious emotional disturbances who receive services in systems of care. Race is not expected to be predictive of differences in growth rates on measures of clinical and functional outcomes.

Hypothesis 3b

There will be a significant relationship between age and sex and initial levels of clinical and functional impairments for children with serious emotional disturbances who receive services in systems of care. There will not be a significant relationship between race and initial levels of clinical and functional impairments.

Rationale

Research investigating children's age and sex in relation to treatment outcomes has produced conflicting results (Barkley et al., 1992; Casey & Berman, 1985; Kazdin & Crowley, 1997; Kazdin & Wassell, 2000; Phillips et al., 2000; Target & Fonagy, 1994; Weisz et al. 1987; Weisz et al., 1995), which makes specifying the direction of the relationships between these variables and clinical and functional outcomes rather difficult. This study seeks to clarify the predictive role children's demographic variables may play in clinical and functional outcomes over time within the system of care, as well as the role such variables may play in accounting for difference in levels of clinical and

functional impairment at intake into services. Several meta-analytic studies have revealed significant sex differences in child therapy outcomes suggesting that females display better treatment response (Casey & Berman, 1985; Weisz et al., 1995). Other studies have also found that sex was a significant predictor of outcomes, again with girls demonstrating better treatment outcomes (Center for Mental Health Services, 1999; Kazdin & Crowley, 1997; Manteuffel et al., 2002). An effect for age on treatment outcomes has also been observed (Kazdin & Crowley, 1997; Target & Fonagy's 1994; Weisz et al., 1987; Weisz et al., 1995). However the direction of this relationship varies across studies with some researchers finding that younger children demonstrate better treatment response compared to adolescents (Target & Fonagy's 1994; Weisz et al., 1987), while others have found that older children and adolescents exhibit better treatment outcomes than younger children (Kazdin & Crowley; Weisz et al., 1995). Still, other studies have found no effect for age or sex on outcomes (Barkley et al., 1992; Kazdin & Wassell, 2000).

The relationship between children's demographic variables and clinical and functional status has also been examined in systems of care research. The most recent Annual Report to Congress on the national systems of care evaluation found no significant differences in children's demographic variables (age, sex, or race) and clinical outcomes as measured by the CBCL between intake into system of care services and the first six month follow up (Center for Mental Health Services, 2001). The report did demonstrate an effect for age, but not sex, on functional outcomes as measured by the CAFAS between intake into system of care services and the first six month follow up. The findings revealed that children between the ages of 11-15 year old, compared to

children 5-10 years old, as well as those between the ages of 16-18 years old, had better functional outcomes on the total CAFAS score (Center for Mental Health Services, 2001). However, previous annual report data found an effect for both age and sex and functional outcomes with females and younger children displaying better functional outcomes on the CAFAS (Center for Mental Health Services, 1999).

Demographic variables have also been associated with differences in clinical and functional impairment at intake into system of care services. There has been conflicting information regarding sex differences in clinical impairment at intake into services. While some research has revealed that girls have greater impairments at intake (Center for Mental Health Services, 2000), other system of care research did not find significant sex differences (Center for Mental Health Services, 1999; 2001). However, boys and older children exhibited greater levels of functional impairment on the CAFAS at intake into system of care services (Center for Mental Health Services, 1999; 2000; 2001). Racial differences in clinical and functional impairments have not been reported in the Annual Reports to Congress (Center for Mental Health Services, 1998; 1999; 2000; 2001).

Analysis for Research Questions 1-3

Two-level latent variable quadratic growth curve models were constructed to examine change in clinical and functional status over time. These models were used to explore the effect of each of the predictor variables (behavioral and emotional strengths, family functioning, caregiver strain, age, sex, and race) (Level 2) on differences in individual growth rates (both first order growth (instantaneous growth) and second order growth (deceleration rate)) on measures of clinical and functional outcomes over time

(Level 1). Because lower scores on both the CBCL and the CAFAS indicate better outcomes, negative instantaneous growth ($b_{17}(\pi_{0i})$) is expected. A positive value for the rate of deceleration ($b_{27}(\pi_{0i})$) would indicate that the effect of time levels off over time, while a negative value would indicate increasing rates of improvement across time. This approach isolates the effect of each predictor variable, while holding all other predictor variables in the model constant. Finally this approach also provides an estimation of the relationship between the predictor variables and differences in initial levels of clinical and functional impairments.

Chapter 4: Results

This study was designed to explore the effect of various individual and family variables on differences in individual growth rates in clinical and functional outcomes on the CBCL and CAFAS, respectively, over time for children with serious emotional disturbances who receive services within systems of care. The relationship between these individual variables and differences in initial levels of clinical and functional impairments were also examined. Specifically, behavioral and emotional strengths (overall Strength Quotient on the BERS), family functioning (General Functioning scale on the FAD), caregiver strain (Global Strain scale on the CGSQ), and children's demographic variables (age, gender, and race) were used to explore differences in clinical and functional status at intake, as well as over time. The overall aim of this study is to develop further insight into changes in clinical and functional outcomes for children with serious emotional disturbances who are served by systems of care.

Descriptive information and correlational statistics for study variables are provided first in this chapter. The second half of the chapter will address the results of the research questions posed in the previous chapter. Two-level latent variable quadratic growth curve models using a multilevel approach were conducted to examine change in clinical and functional status over time during a twenty-four month time period. This analytical strategy also permits the simultaneous investigation of how children's psychosocial and demographic variables at intake predict differences in growth rates on

measures of clinical and functional outcomes over time. Finally, this analytical approach can also provide information regarding how these explanatory variables are related to differences in levels of clinical and functional impairment at intake into system of care services. The software program HLM 5.0 (Raudenbush, Bryk, Cheong, and Congdon, 2000) was used to conduct all quadratic growth curve models.

DESCRIPTIVE ANALYSES

Participants

Although there can be missing data on the outcome variables, one of the requirements of the HLM software is that there are no missing data for any of the Level 2 predictor variables (Raudenbush et al., 2000). Given that initial level of functional impairment on the CBCL or the CAFAS was used to estimate the predicted, or latent initial status, which was used as an explanatory variable at Level 2, there were two different sample sizes for each of the respective models. Therefore, there was a total of three separate, but overlapping samples; one for the children participating in the national evaluation who were enrolled in the Child and Family Outcomes Study and between the ages of 7 and 18, (Total Sample), one for all of the youth who had complete data on all the predictor variables including initial level of clinical impairment as measured by the CBCL (CBCL Sample), and one for all of the youth who had complete data on all the predictor variables including the initial level of functional impairment as measured by CAFAS (CAFAS Sample).

The Total Sample consisted of 8,327 children with serious emotional disturbances between the ages of 7 and 18 (M = 12.70; SD = 2.84). Consistent with other systems of

care demographic information (Center for Mental Health Services, 1998; 1999; 2000; 2001), a large proportion of the Total Sample were male (n = 5,573; 66.9%). Also consistent with previous systems of care research (Center for Mental Health Services, 1998; 1999; 2000; 2001), the majority of the sample were white (n = 4,625; 58.8%).

The demographic characteristics of the analytical samples appear to be quite similar to the total sample. The CBCL Sample consisted of 5,925 children with serious emotional disturbances between the ages of 7 and 18 (M = 12.60; SD = 2.80). Again a greater proportion of children were male (n = 3,961; 66.9%) and were white (n = 3,581; 60.4%). Similarly, the CAFAS Sample was made up of 5,750 children with serious emotional disturbances between the ages of 7 and 18 (M = 12.61; SD = 2.79). This sample was largely male (n = 3,860; 67.1%) and white (n = 2,245; 61.0%). Table 2 represents descriptive data regarding age and gender for all three samples, and Table 3 provides information regarding the racial backgrounds for the youth in each of the samples.

Predictor and Outcome Variables

Descriptive statistics for each of the predictor variables, as well as the outcome variables at each time point (intake through 24 months), are provided in Tables 4-6 (Table 4: Total Sample, Table 5: CBCL Sample, Table 6: CAFAS Sample). Since these groups are not mutually exclusive, comparisons between the groups on each of the variables were not made. As is depicted in Tables 4-6, for all three groups the means on the CBCL become smaller over time indicating improvement in clinical outcomes, with the size of the decrease in means on the CBCL becoming smaller across time. This same trend was also evident for the CAFAS means.

Table 2

Descriptive Data for Age and Sex for the Total, CBCL, and CAFAS Samples

		Total Sample		CBCL Sample		CAFAS Sample	
Sample size		*n* = 8,327		*n* = 5,925		*n* = 5,750	
Age	*M*	12.70		12.60		12.60	
	SD	2.84		2.80		2.79	
		Male	**Female**	**Male**	**Female**	**Male**	**Female**
Sex	Frequency	5,573	2,754	3,961	1,964	3,860	1,890
	Percent	66.9%	33.1%	66.9%	33.1%	67.1%	32.9%

Bivariate associations among the predictor variables, as well as among the predictor variables and the measures of clinical and functional outcomes at each time point (intake through 24 months) for each of the different samples, were computed. The direction and value of correlations were similar across the three individual samples. As expected, negative correlations were found between clinical and functional status at intake and behavioral and emotional strengths at intake for all three samples. This is consistent with previous systems of care research which revealed a similar negative correlation between functional impairment and behavioral and emotional strengths at intake (Center for Mental Health Services, 1999; 2000; 2001). Although still statistically significant, the strength of the relationships between explanatory variables at intake and clinical and functional outcomes decreased at every time point. For all three samples, greater caregiver strain at intake was also associated with greater levels of clinical and functional impairments at intake, which again reflects previous findings from systems of

Table 3

Frequency Distribution for Racial Information for the Total, CBCL, CAFAS Samples

	Total Sample (n[1] = 7906)		CBCL Sample (n = 5925)		CAFAS Sample (n = 5750)	
	Freq.	Percent[2]	Freq.	Percent[2]	Freq.	Percent[2]
White, non-Hispanic	4,652	58.84%	3,581	60.4%	3,505	61.0%
African American	2,044	25.9%	1,558	26.3%	5,121	26.5%
Hispanic	1,024	12.7%	711	12.1%	700	12.4%
American Indian or Alaska Native	657	8.3%	395	6.7%	335	5.8%
Asian	63	0.8%	40	0.7%	40	0.7%
Native Hawaiian or Pacific Islander	38	0.5%	26	0.4%	25	0.4%
Multi-racial	681	8.6%	543	9.3%	534	9.4%
Other	91	1.2%	66	1.1%	66	1.1%

Note[1]: The sample size differs due to missing data
Note[2]: The sum of these percentages are greater than 100% as racial categories were not mutually exclusive

care research (Center for Mental Health Services, 1999; 2000; 2001). Although significant, smaller correlations were found between family functioning at intake and measures of clinical and functional outcomes at all time points for all three samples. Positive correlations were also found between measures of clinical impairments (CBCL) and functional (CAFAS) impairments at all time points, with the strongest

Table 4

Descriptive Statistics for Predictor and Outcome Variables for Total Sample

Variable	*N*	Min.	Max.	*M*	*SD*
BERS-SQ	6,964	38	142	86.86	17.12
CGSQ-CS	6,766	1	5	2.99	0.90
FAD-GF	6,706	1	4	2.89	0.45
CBCL-Intake	7,137	23	94	69.80	10.43
CBCL-6 mo	4,621	23	93	67.14	11.27
CBCL-12 mo	3,647	23	96	65.71	11.49
CBCL-18 mo	2,712	23	92	64.61	11.90
CBCL-24 mo	2,066	23	92	63.74	11.96
CAFAS-Intake	7,097	0	240	111.50	47.46
CAFAS-6 mo	4,592	0	240	96.11	49.38
CAFAS-12 mo	3,579	0	240	91.59	50.20
CAFAS-18 mo	2,690	0	240	86.37	50.41
CAFAS-24 mo	2,049	0	230	82.69	50.92

correlations between congruent time points. Tables 7-9 (Table 7: Total Sample, Table 8: CBCL Sample, Table 9: CAFAS Sample) provide the results of the bivariate correlations between the predictor variables and among the predictor variables and the outcome variables at each of the time points.

Table 5

Descriptive Statistics for Predictor and Outcome Variables for CBCL Sample

Variable	*N*	Min.	Max.	*M*	*SD*
BERS-SQ	5,925	38	142	86.77	17.20
CGSQ-CS	5,925	1	5	3.00	0.90
FAD-GF	5,925	1	4	2.90	0.47
CBCL-Intake	5,925	23	94	70.04	10.34
CBCL-6 mo	3,860	23	93	67.17	11.27
CBCL-12 mo	3,032	23	93	65.71	11.38
CBCL-18 mo	2,228	23	92	64.73	11.81
CBCL-24 mo	1,717	23	92	63.91	11.98
CAFAS-Intake	5,623	0	240	113.04	47.35
CAFAS-6 mo	3,784	0	240	96.81	49.41
CAFAS-12 mo	2,969	0	240	92.13	50.15
CAFAS-18 mo	2,219	0	240	86.21	50.18
CAFAS-24 mo	1,699	0	230	83.23	51.14

RESULTS OF THE RESEARCH QUESTIONS

All of the participants with complete data for all of the predictor variables, including initial level of clinical or functional impairment, depending on the appropriate model, were used in the analysis. The reader is referred to Equations 1-7 presented in Chapter 3 for the specific unconditional, conditional, and latent variable conditional models. These models, which were described in Chapter 3, were used to examine

Table 6

Descriptive Statistics for Predictor and Outcome Variables for CAFAS Sample

Variable	*N*	Min.	Max.	*M*	*SD*
BERS-SQ	5,750	38	142	86.60	17.13
CGSQ-CS	5,750	1	5	3.00	0.90
FAD-GF	5,750	1	4	2.89	0.47
CBCL-Intake	5,623	23	94	70.22	10.21
CBCL-6 mo	3,775	23	93	67.24	11.22
CBCL-12 mo	2,967	23	93	65.76	11.30
CBCL-18 mo	2,192	23	92	64.66	11.83
CBCL-24 mo	1,697	23	92	63.84	12.00
CAFAS-Intake	5,750	0	240	112.62	47.47
CAFAS-6 mo	3,768	0	240	96.72	49.54
CAFAS-12 mo	2,931	0	240	92.59	50.30
CAFAS-18 mo	2,191	0	240	86.15	50.16
CAFAS-24 mo	1,682	0	230	83.38	51.21

differences in initial level of clinical and functional impairment (initial status) and individual growth rates on measures of clinical and functional outcomes, as well as to examine individual characteristics that predict variability in initial status and the growth parameters (instantaneous growth and rate of deceleration). The same models were used for measures of clinical and functional status (CBCL and CAFAS).

Table 7

Intercorrelations Between Predictor Variables and Measures of Clinical and Functional Status at Different Time Points for the Total Sample

	BERS-SQ	**CGSQ-CS**	**FAD-GF**	**CBCL Intake**	**CBCL 6 mo**	**CBCL 12 mo**	**CBCL 18 mo**	**CBCL 24 mo**	**CAFAS Intake**	**CAFAS 6 mo**	**CAFAS 12 mo**	**CAFAS 18 mo**
CGSQ-CS	-.452**											
FAD-GF	.377**	-.366**										
CBCL-Intake	-.473**	.530**	-.223**									
CBCL-6 mo	-.332**	.386**	-.144**	.646**								
CBCL-12 mo	-.281**	.328**	-.124**	.564**	.672**							
CBCL-18 mo	-.269**	.298**	-.115**	.536**	.626**	.700**						
CBCL-24 mo	-.234**	.296**	-.112**	.509**	.562**	.625**	.724**					
CAFAS-Intake	-.420**	.479**	-.207**	.562**	.404**	.332**	.322**	.298**				
CAFAS-6 mo	-.293**	.345**	-.133**	.411**	.599**	.429**	.418**	.366**	.562**			
CAFAS-12 mo	-.258**	.294**	-.110**	.359**	.469**	.623**	.492**	.421**	.452**	.605**		
CAFAS-18 mo	-.226**	.267**	-.090**	.358**	.435**	.483**	.647**	.496**	.418**	.530**	.635**	
CAFAS-24 mo	-.192**	.264**	-.091**	.348**	.386**	.413**	.493**	.640**	.384**	.476**	.554**	.613**

** Correlation is statistically significant at $p < 0.01$ (2-tailed)

Table 8

Intercorrelations Between Predictor Variables and Measures of Clinical and Functional Status at Different Time Points for the CBCL Sample

	BERS-SQ	CGSQ-CS	FAD-GF	CBCL Intake	CBCL 6 mo	CBCL 12 mo	CBCL 18 mo	CBCL 24 mo	CAFAS Intake	CAFAS 6 mo	CAFAS 12 mo	CAFAS 18 mo
CGSQ-CS	-.455**											
FAD-GF	.377**	-.361**										
CBCL-Intake	-.488**	.539**	-.222**									
CBCL-6 mo	-.341**	.393**	-.145**	.650**								
CBCL-12 mo	-.282**	.325**	-.109**	.577**	.666**							
CBCL-18 mo	-.272**	.302**	-.110**	.545**	.629**	.705**						
CBCL-24 mo	-.233**	.290**	-.106**	.517**	.578**	.650**	.731**					
CAFAS-Intake	-.424**	.496**	-.206. **	.574**	.415**	.338**	.332**	.308**				
CAFAS-6 mo	-.296**	.344**	-.134**	.422**	.603**	.427**	.413**	.378**	.573**			
CAFAS-12 mo	-.259**	.293**	-.108**	.356**	.465**	.624**	.487**	.428**	.455**	.596**		
CAFAS-18 mo	-.221**	.262**	-.088**	.369**	.438**	.484**	.653**	.501**	.436**	.529**	.622**	
CAFAS-24 mo	-.185**	.253**	-.088**	.351**	.383**	.423**	.490**	.636**	.398**	.489**	.562**	.613**

** Correlation is statistically significant at $p < 0.01$ (2-tailed)

Table 9

Intercorrelations Between Predictor Variables and Measures of Clinical and Functional Status at Different Time Points for the CAFAS Sample

	BERS-SQ	CGSQ-CS	FAD-GF	CBCL Intake	CBCL 6 mo	CBCL 12 mo	CBCL 18 mo	CBCL 24 mo	CAFAS Intake	CAFAS 6 mo	CAFAS 12 mo	CAFAS 18 mo
CGSQ-CS	-.456**											
FAD-GF	.375**	-.363**										
CBCL-Intake	-.485**	.542**	-.222**									
CBCL-6 mo	-.335**	.386**	-.149**	.648**								
CBCL-12 mo	-.278**	.325**	-.115**	.552**	.662**							
CBCL-18 mo	-.273**	.302**	-.109**	.549**	.629**	.702**						
CBCL-24 mo	-.230**	.292**	-.109**	.518**	.576**	.648**	.732**					
CAFAS-Intake	-.424**	.496**	-.205**	.574**	.415**	.340**	.332**	.308**				
CAFAS-6 mo	-.295**	.343**	-.131**	.423**	.606**	.430**	.411**	.378**	.571**			
CAFAS-12 mo	-.256**	.291**	-.106**	.353**	.467**	.626**	.485**	.428**	.456**	.599**		
CAFAS-18 mo	-.219**	.263**	-.085**	.368**	.437**	.479**	.652**	.500**	.438**	.532**	.620**	
CAFAS-24 mo	-.183**	.254**	-.090**	.353**	.384**	.425**	.491**	.639**	.396**	.488**	.559**	.616**

** Correlation is statistically significant at $p < 0.01$ (2-tailed)

Review of Research Questions

The aim of the current dissertation study was to examine the impact of various individual characteristics on variability in clinical and functional outcomes over time, as well as variability in levels of clinical and functional impairment at intake. The primary research question addressed the relationship between children's behavioral and emotional strengths and differences in change over time on measures of clinical and functional impairment, as well as differences in initial levels of clinical and functional impairment. The second research question sought to examine the relationship between caregiver strain and family functioning and differences in change over time on measures of clinical and functional impairment, as well as differences in initial levels of clinical and functional impairment. Finally, the third research question explored the relationship between children's demographic variables (age, sex, and race) and differences in change over time on measures of clinical and functional impairment, as well as the impact these variables had on differences in initial levels of clinical and functional impairment.

All of the research questions can be answered using the same analytical approach, with the same growth models. Each of the models (unconditional and latent variable conditional) were run twice, once for measures of clinical impairment (CBCL-Total Problem scores) and once for measures of functional impairment (CAFAS-Total Scores). The results for models using measures of clinical impairment are presented first, and the models using measures of functional impairment follow. For both clinical and functional impairment, unconditional models will be presented first to provide estimates of average initial status and average rates of growth, in addition to variation in these estimates. Results from the latent variable conditional models will follow. Recall that the

conditional models include explanatory variables at Level 2, thus permitting the investigation of the impact of these variables on the growth parameters, as well as initial status.

In addition to providing standard statistical test results, two different types of effect sizes were calculated to provide estimates of clinical significance. The effect sizes for the statistically significant individual predictor variables were calculated by computing the predicted differences in the outcome measures (either CBCL Total Problem scores or CAFAS Total Scores) at each of the time points for participants who differed on the predictor variable by one standard deviation. This difference was then divided by the standard deviation of latent initial status (either CBCL Total Problem scores or CAFAS Total Scores). The second type of effect size, the proportion of variance explained, provides an estimate of clinical significance for the overall model. As the name implies, this effect size estimates the amount of variability in initial status, as well as growth parameters (instantaneous growth and rates of deceleration), that is accounted for by including the explanatory variables. The proportion of variance explained is calculated by computing the difference in the variance for the parameter of interest (initial status, instantaneous growth, or deceleration rate) in the unconditional model and conditional model, and dividing that difference by the variance in the unconditional model.

Results for Clinical Outcomes (CBCL)

Unconditional Model

Table 10 presents the results from the unconditional model which provides average estimates of initial status and first and second order change over time on the

CBCL Total Problem scores, as well as variability in initial status and first and second order growth rates. As shown in Table 10, the intercept, β_{00} (average initial status) was 69.99, which reflects impairment in the clinically significant range. The point estimates

Table 10

Quadratic Model of Change in Clinical Status (CBCL) (Unconditional Model)

Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Mean initial status (β_{00})	69.99	0.134	521.24	5924	<0.01
Mean first order growth (β_{10})	-3.49	0.136	-25.65	5924	<0.01
Mean second order growth (β_{20})	0.45	0.036	12.46	5924	<0.01

Random Effect	Standard Deviation	Variance Component	df	χ^2	P Value
Initial status, τ_{00}	8.44	71.17	3166	8659.28	<0.01
First order growth, τ_{11}	3.86	14.87	3166	3818.38	<0.01
Second order growth, τ_{22}	0.84	0.71	3166	3775.44	<0.01
Level-1 error, e_{ti}	6.15	37.79			

for first order growth rate (instantaneous growth, β_{10}) and second order growth rate (rate of deceleration, β_{20}) were -3.49 and 0.45, respectively. The coefficients for each of the parameters were statistically significant ($p < 0.01$) supporting the decision to model nonlinear, quadratic growth rather than linear growth. It is important to note that due to the way the CBCL is scaled, with better clinical functioning reflected by lower scores, that a negative instantaneous growth rate is expected and indicates improvement in clinical status. The positive value for the deceleration indicates that the change in clinical

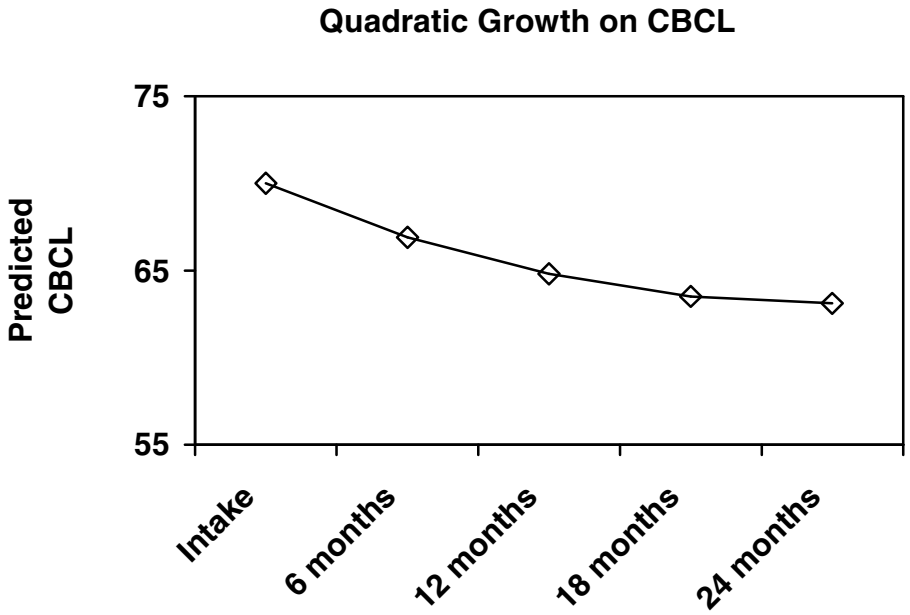
status becomes smaller across time. Thus there is greater improvement early on, but lesser growth over the latter months of the study.

Figure 1 depicts the predicted average trend in improved clinical outcomes over twenty-four months. As is evident in Figure 1, the greatest amount of improvement in clinical outcomes occurs between intake into services and six months, with more gradual improvements in clinical impairments over increasing time. An examination of the variance in initial status ($\tau_{00} = 71.17$) indicates that children vary significantly in clinical impairment at intake in system of care services ($\chi^2 = 8659.28$, $p < 0.01$). There was also statistically significant variation in children's first order growth rates ($\chi^2 = 3818.38$, $p < 0.01$), as well as in children's second order growth rates ($\chi^2 = 3775.44$, $p < 0.01$). The statistically significant variability in initial status and in both first and second order individual growth rates warrants additional analyses including predictors at Level-2 (Conditional Model) to account for some of the variability in these parameters.

Latent Variable Conditional Model

Table 11 presents the results from the latent variable conditional model. This model adjusts the effects of a given predictor variable for each of the other predictor variables in the model, including latent initial status, and estimates the impact of these variables on the growth curve parameters. This model includes the following predictor variables at Level-2: age, sex (a dummy variable with 0 = male; 1 = female), BERS score, CGSQ score, FAD score, and race (a dummy variable with 0 = non-white; 1 = white). In addition, this model also includes latent initial status on the CBCL, to control for the impact of clinical impairments at intake on the growth parameters. Due to the

Figure 1. Expected Scores for Clinical Status (CBCL) Across Time



complexity of the quadratic growth model, graphical displays (Figures 2-6) will be used to describe the effect of significant predictors of initial status, first order (instantaneous) growth, and second order growth (rate of deceleration) as suggested by Tate, 1998.

As is depicted in Table 11, behavioral and emotional strengths, caregiver strain, family functioning, age, sex, and race were significant predictors of level of clinical impairment at intake into services. As expected, controlling for other predictors in the model, children with fewer behavioral and emotional strengths displayed greater rates of clinical impairment at intake into services. At intake, controlling for other variables in the model, caregiver strain and family functioning were both associated with clinical status at intake into services, with children whose parents experienced greater levels of caregiver strain displaying greater levels of clinical impairment. Children with greater levels of family dysfunction demonstrated greater levels of clinical impairment at intake

Table 11

Quadratic Model of Change in Clinical Status (CBCL) with the Effects of Predictors Adjusted for Differences in Initial Status (Latent Variable Conditional Model)

Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Model for initial status, π_{0i}					
Base, β_{00}	69.56	0.173	402.95	5918	<0.01
Age, β_{01}	-0.60	0.038	-15.64	5918	<0.01
Sex, β_{02}	-0.65	0.233	-2.78	5918	0.006
BERS, β_{03}	-0.19	0.007	-26.32	5918	<0.01
CGSQ, β_{04}	4.64	0.135	34.34	5918	<0.01
FAD, β_{05}	-0.65	0.248	2.63	5918	0.009
RACE, β_{06}	1.19	0.211	5.62	5918	<0.01
Model for first order growth, π_{1i}					
Base, β_{10}	-33.40	4.029	-8.29	5918	<0.01
Age, β_{11}	0.22	0.066	3.26	5918	0.001
Sex, β_{12}	0.10	0.345	2.88	5918	0.004
BERS, β_{13}	0.12	0.016	7.76	5918	<0.01
CGSQ, β_{14}	-2.99	0.334	-8.95	5918	<0.01
FAD, β_{15}	-0.24	0.365	-0.66	5918	0.507
RACE, β_{16}	-0.95	0.316	3.02	5918	0.003

Table 11 (Continued)

Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Latent Initial CBCL, β_{17}	0.43	0.058	7.44	5918	<0.01
Model for second order growth, π_{2i}					
Base, β_{20}	6.96	0.922	7.55	5918	<0.01
Age, β_{21}	-0.06	0.016	-363	5918	0.001
Sex, β_{22}	-0.15	0.875	-1.75	5918	0.080
BERS, β_{23}	-0.02	0.004	-5.93	5918	<0.01
CGSQ, β_{24}	0.59	0.080	7.44	5918	<0.01
FAD, β_{25}	0.05	0.092	0.56	5918	0.577
RACE, β_{26}	0.19	0.080	2.44	5918	0.015
Latent Initial CBCL, β_{27}	-0.09	0.013	-7.11	5918	<0.01

Random Effect	Standard Deviation	Variance Component	df	χ^2	p Value
Initial status, τ_{00}	5.37	28.86	3160	5238.65	<0.01
First order growth, τ_{11}	2.75	7.57			
Second order growth, τ_{22}	0.64	0.41			
Level-1 error, e_{ti}	6.15	37.77			

into services. Age was negatively associated with clinical impairment at intake into services, such that younger children displayed greater levels of clinical impairment. Sex

was also negatively related to clinical impairment, after controlling for other predictors in the model, with males displaying greater levels of impairment at intake into services. Controlling for other variables in the model, race was positively associated with clinical impairment such that white children displayed greater levels of impairment at intake into services. Because family functioning (FAD-GF) was not a significant predictor of either first or second order growth, a graphical representation for the effect of the FAD-GF was not constructed.

Table 11 also presents the effects of the explanatory variables on instantaneous growth rates. As a reminder, the results from the unconditional model indicated that children demonstrated significant instantaneous growth rates as reflected by improved clinical status (decreasing scores on the CBCL Total Problems scale) (β_{10} = -3.49, t = -25.65, $p < 0.01$). In this model, behavioral and emotional strengths ($p < 0.01$), caregiver strain ($p < 0.01$), age ($p = 0.001$), sex ($p = 0.004$), and race ($p = 0.003$) were significant predictors of instantaneous growth rates. The results also indicate that there is a significant association between latent initial status and instantaneous growth rate (β_{17} = 0.43, t = 7.44, $p < 0.01$), thus supporting the decision to include latent initial status as a predictor at Level 2. Contrary to expectations, family functioning was not a significant predictor of first order growth (t = -0.66, $p = 0.51$). Behavioral and emotional strengths, age, sex, and latent initial status were positively associated with instantaneous growth, while caregiver strain and race were negatively associated with first order growth. These results indicate there was somewhat of a "catching up" between intake and the six month

follow-up for those individuals who had greater levels of impairment at intake into services.

The effects of the explanatory variables on deceleration rates (curvature) over time are presented in Table 11. Recall, the results from the unconditional model presented in Table 10, indicated that there were significant rates of deceleration reflecting greater improvement initially with a more gradual rate of improvement over increasing time ($\beta_{20} = 0.45$, $t = 12.46$, $p < 0.01$). The positive value of deceleration coefficient indicates that the effect of time levels off across time. After accounting for differences in latent initial status, as well as other predictor variables in the Level 2 model, behavioral and emotional strengths ($p < 0.01$), caregiver strain ($p < 0.01$), age ($p < 0.001$), and race ($p = .015$) were predictive of differences in rates of deceleration. Latent initial status was also a significant predictor of deceleration rates ($\beta_{27} = -0.09$, $t = -7.11$, $p < 0.01$). Family functioning and sex were not significantly predictive of second order growth (deceleration rates) ($t = .56$, $p = 0.58$ and $t = -1.75$, $p = 0.08$, respectively).

Children's behavioral and emotional strengths were significantly related to initial status, instantaneous growth, and rate of deceleration (see Table 11). Figure 4 displays the initial status and expected growth trajectories on the CBCL for individuals with an average BERS Overall Strength Quotient, and one standard deviation above and below the average amount of behavioral and emotional strengths. All other predictor variables are held constant at their means for continuous variables or at a value of zero for the dichotomous variables. As shown in Figure 2, at each time point those individuals with greater behavioral and emotional strengths display better clinical outcomes than those

with fewer strengths. As also displayed in the plot, each of these groups demonstrated improved clinical outcomes throughout the two year period of time, with the greatest improvement occurring from intake to 6 months. Further, while the differences in the CBCL scores at each time point varied across time for the individuals having different amounts of emotional strengths, the standardized differences were relatively large initially, but smaller at the subsequent time points. The standardized differences were the greatest at intake 0.40, were the smallest at 18 months (0.06), and were 0.14 at the last time point. As is evident by the varying effect sizes at each time point, the differences were the greatest at intake and were relatively smaller after that, illustrating that those children who displayed greater clinical impairment initially "caught up" over time with those who were doing better at intake.

Figure 2. Effect of BERS at Intake on Improvement in Clinical Outcomes

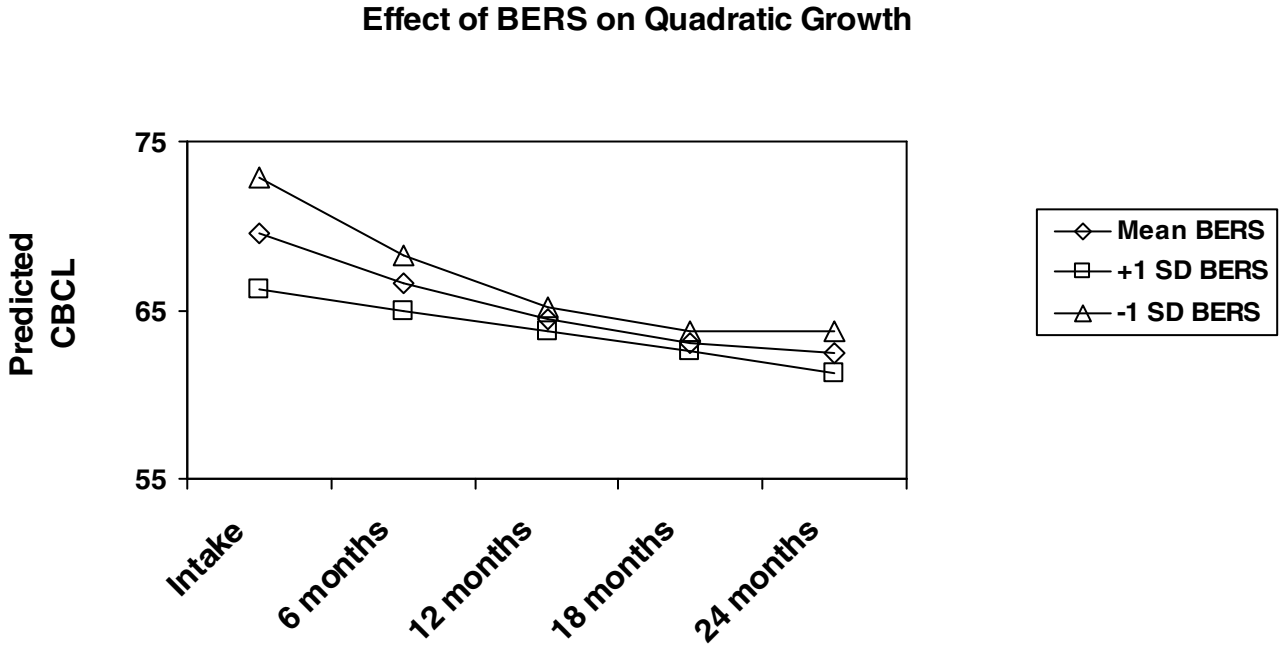
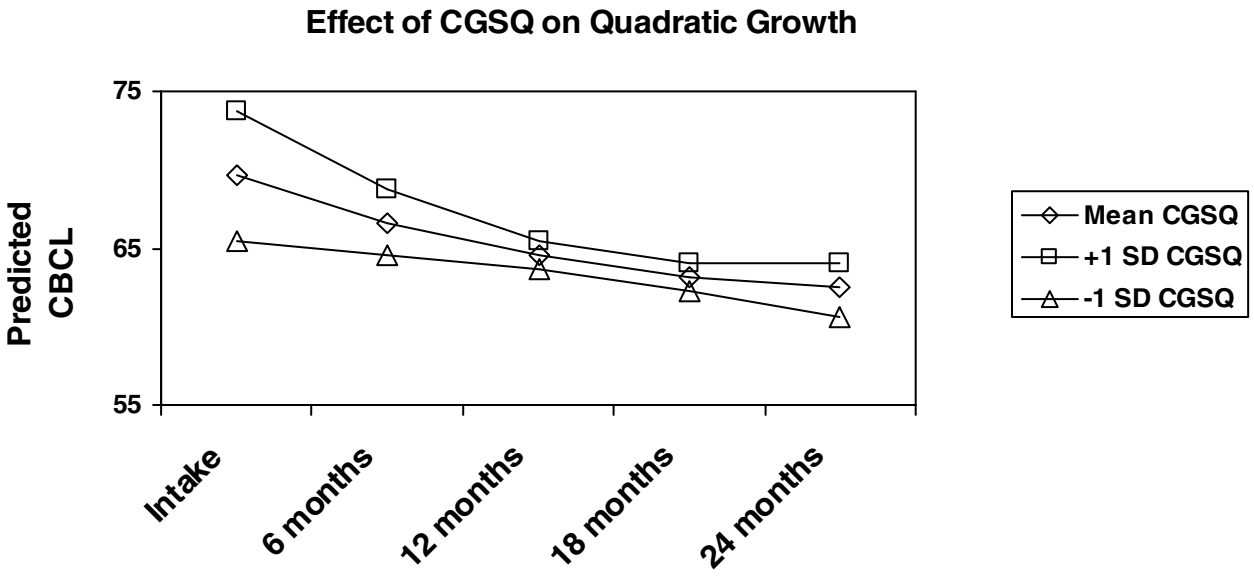


Table 11 indicated that caregiver strain was a significant predictor of initial status, instantaneous growth, and rate of deceleration. Figure 3 depicts the initial status and expected growth trajectories on the CBCL Total Problem scores for individuals having average scores on the Global Strain Scale of the CGSQ, one standard deviation above the average, and one standard deviation below the average CGSQ-GS. The other predictor variables are held constant at their means for continuous variables or at a value of zero for the dichotomous variables. As shown in the plot, although each of these groups of individuals improved throughout the course of services, at every time point children whose caregivers report experiencing less strain had better clinical outcomes. This plot also illustrates that the greatest improvement occurs from intake to 6 months for each of the groups, but this was most dramatic for those individual's whose parents experienced more caregiver strain. Further, while the differences in the CBCL scores at each time point varied across time for the individuals having different levels of caregiver strain, the standardized differences were relatively large initially and small to moderate at each subsequent time point. Specifically, the standardized differences were 0.49 intake, were smallest at 12 and 18 months (0.11), and were 0.23 at the last time point. Again, the differences were largest at intake, and quite a bit smaller after that illustrating the catching up over time.

Table 11 indicated that age was significantly related to initial status and the growth trajectories. Figure 4 depicts the initial status and the expected growth trajectories for the CBCL Total Problem scale for individuals having the average age, one standard deviation above the average, and one standard deviation below the average age. All other predictor variables are held constant at their means for continuous variables

Figure 3. Effect of Caregiver Strain at Intake on Improvement in Clinical Outcomes

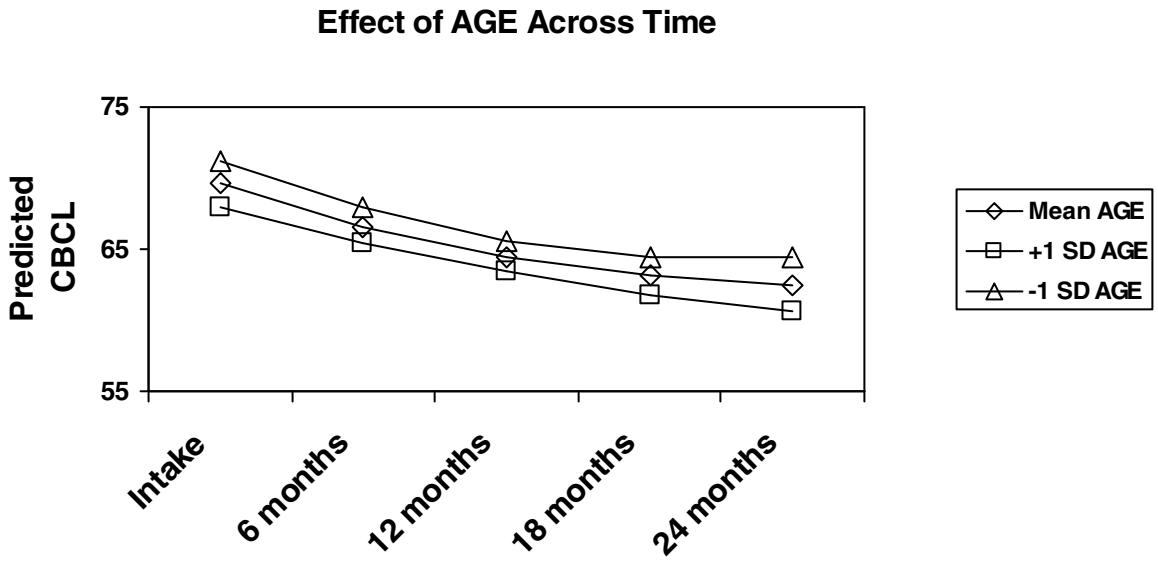


or at a value of zero for the dichotomous variables. As shown in the plot, each of these age groups improved throughout the course of services, with the greatest improvement occurring from intake to 6 months. Further, while the differences in the CBCL scores at each time point varied across time for the individuals having different ages, the standardized differences were quite small at each time point. Specifically, the standardized differences were 0.20 intake, were smallest at 6 months (0.13), and were 0.23 at the last time point.

As indicated in Table 11, sex was significantly related to initial status and instantaneous growth, but not rate of deceleration. Figure 5 illustrates initial status and the expected growth trajectories for the CBCL for both males and females. All other predictor variables are held constant at their means for continuous variables or at a value of zero for the dichotomous variables. As shown in the plot, both males and females improved over the course of twenty-four months, with the greatest improvement

occurring from intake to 6 months. Although males initially started out with greater levels of clinical impairment, at 24 months, female were doing more poorly. Moreover, while the differences in the CBCL scores at each time point varied across time for males and females, the standardized differences were small at each time point. Specifically, the standardized differences were 0.08 intake, were smallest at 6 months (0.02), and were 0.11 at the last time point.

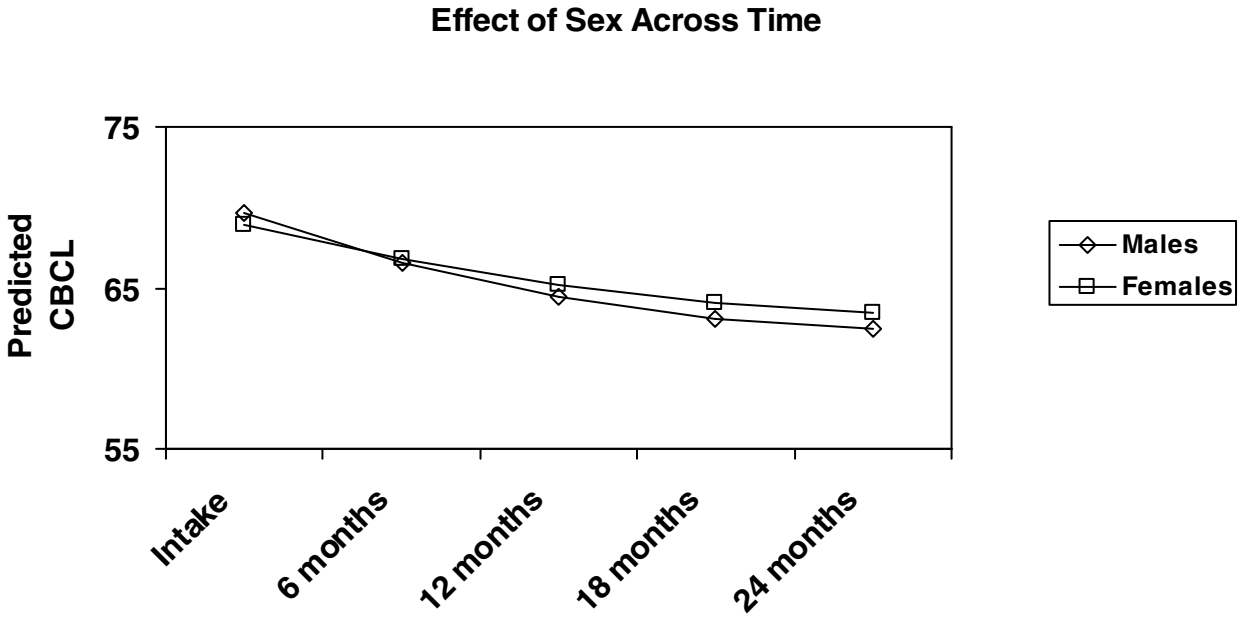
Figure 4. Effect of Age at Intake on Improvement in Clinical Outcomes



Race was a significant predictor of initial status and first and second order growth, as indicated in Table 11. Initial status and the expected growth trajectories for the CBCL for both white and non-white racial groups are displayed in Figure 6. The other predictor variables are held constant at their means for continuous variables or at a value of zero for the dichotomous variables. The plot shows that both racial groups improved over the course of twenty-four months with the greatest improvement occurring from intake to 6

months. Moreover, while the differences in the CBCL scores at each time point varied across time for white and non-white racial groups, the standardized differences were quite small at each time point. Specifically, the standardized differences were 0.13 intake, were smallest at 12 and 18 months (0.01), and were 0.06 at the last time point.

Figure 5. Effect of Sex on Improvement in Clinical Outcomes



Overall the results from the latent variable conditional model indicated a general pattern of improvement over time such that children who were younger, male, and white and presented with greater clinical impairment and few emotional and behavioral strengths at intake improved more within the first six months (i.e. have greater instantaneous growth) than their counterparts; however, their improvement levels off faster across time (i.e. have greater deceleration). It is noteworthy that even though these children have greater deceleration across time, the difference in their clinical outcomes at

24 months is always smaller, and usually much smaller than at intake into system of care services. Although there appears to be greater deceleration of treatment effects for these children their predicted CBCL Total Problems T-scores improve over time from intake.

Figure 6. Effect of Race on Improvement in Clinical Outcomes

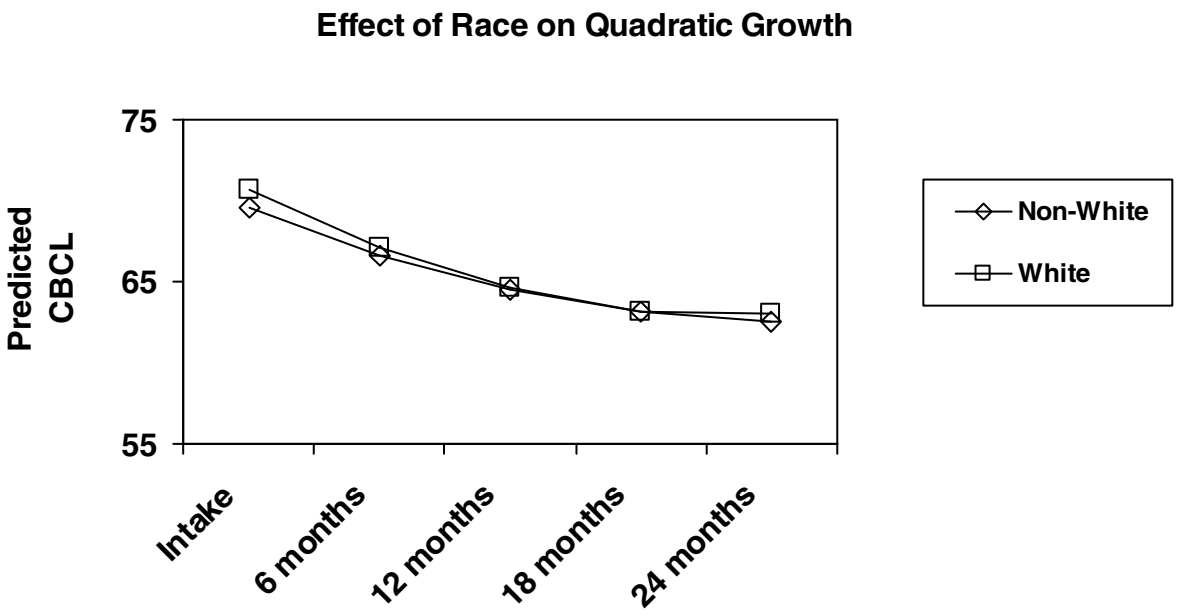


Table 12 provides an estimate of effect size for the entire latent variable quadratic growth model. The inclusion of all the predictors in the model accounts for 59.45% of the individual variability in clinical impairment at intake into services, 49.12% of the individual variability in instantaneous growth, and 42.13% of the individual variation in rate of deceleration. Thus, the differences in children's behavioral and emotional strengthens, caregiver strain, demographic variables, and latent initial status account for a

large amount of the variability in impairment at intake into services, as well as the individual growth trajectories.

Table 12

Amount of Variance Explained in Initial Status and First and Second Order Growth for CBCL as a Result of All Predictor Variables

Model	Initial Status Variance, (τ_{00})	First Order Growth Variance, (τ_{11})	Second Order Growth Variance, (τ_{22})
Unconditional Model	71.168	14.871	0.712
Latent Conditional Model	28.861	7.567	0.412
Proportion of Variance Explained	59.45%	49.12%	42.13%

Results for Functional Outcomes (CAFAS)

Unconditional Model

The results from the unconditional model are presented in Table 13. As a reminder, the unconditional model provides average estimates of initial status and the growth parameters (instantaneous growth and deceleration rates) over time on the CAFAS. This model also estimates the variability in initial status and first and second order growth rates. As is specified in Table 13, the intercept, β_{00} (average initial status) was 112.19, which reflects marked impairment in functional status. The point estimates for first order growth rate (instantaneous growth, β_{10}) and second order growth rate (rate of deceleration, β_{20}) were -15.69 and 2.14, respectively, indicating significant improvement in functional outcomes over time. Similar to the findings for clinical outcomes, the coefficients for each of the parameters were statistically significant ($p <$

0.01) supporting the decision to again model nonlinear, quadratic growth rather than linear growth. Like the CBCL, greater functional impairment is indicated by higher scores on the CAFAS, and thus a negative instantaneous growth rate is again expected and is reflective of improvement in functional outcomes.

Table 13

Quadratic Model of Change in Functional Status (CAFAS) (Unconditional Model)

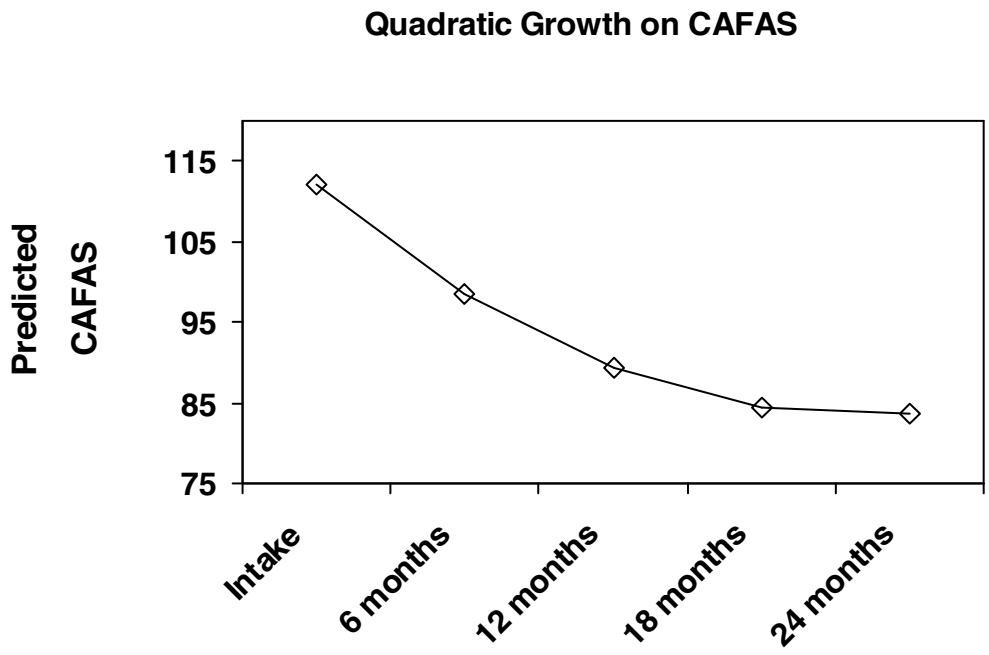
Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Mean initial status (β_{00})	112.19	0.624	179.69	5749	<0.01
Mean first order growth (β_{10})	-15.69	0.675	-23.26	5749	<0.01
Mean second order growth (β_{20})	2.14	0.175	12.21	5749	<0.01

Random Effect	Standard Deviation	Variance Component	df	χ^2	P Value
Initial status, τ_{00}	36.98	1367.82	3081	7550.80	<0.01
First order growth, τ_{11}	19.40	376.19	3081	36.10	<0.01
Second order growth, τ_{22}	3.98	15.85	3081	3493.93	<0.01
Level-1 error, e_{ti}	30.44	927.04			

Figure 7 depicts the average trend in improved functional outcomes over twenty-four months. As Figure 7 illustrates, the greatest amount of improvement in functional outcomes occurs between intake into services and six months, with more gradual improvements in functional impairments over time. An examination of the variance in initial status ($\tau_{00} = 1367.82$) indicates that children vary significantly in functional impairment at intake in system of care services ($\chi^2 = 7550.80$, $p < 0.01$). There was also

statistically significant variation in children's instantaneous growth rate ($\chi^2 = 3644.10$, $p < 0.01$), as well as in children's deceleration rate ($\chi^2 = 3493.39$, $p < 0.01$). The statistically significant variability in these parameters indicates that further analyses are warranted to explain some of the residual variability in initial status and the growth trajectories.

Figure 7. Expected Scores for Functional Status (CAFAS) Across Time



Latent Variable Conditional Model

Table 14 presents the results from the latent variable conditional model for functional outcomes. As before in the model for clinical outcomes, this model adjusts the effect of the predictor variables for differences in latent initial status (on the CAFAS) and estimates the impact of latent initial status on growth curve trajectories. Like the

previous conditional model, in addition to latent initial status, this model includes the following predictor variables at Level-2: age, sex (a dummy variable with 0 = male; 1 = female), BERS-SQ score, CGSQ-GS score, FAD-GF score, and race (a dummy variable with 0 = non-white; 1 = white). Similar to the models for improvements in clinic status on the CBCL, given the complexity of the quadratic growth model, graphical displays will be used to describe the effect of significant predictors of initial status and the growth parameters (instantaneous growth and rate of deceleration) as suggested by Tate, 1998.

Table 14

Quadratic Model of Change in Functional Status (CAFAS) with the Effects of Predictors Adjusting for Differences in Initial Status (Latent Variable Conditional Model)

Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Model for initial status, π_{0i}					
Base, β_{00}	114.98	0.864	133.12	5743	<0.01
Age, β_{01}	0.57	0.190	3.01	5743	0.003
Sex, β_{02}	-9.81	1.170	-8.38	5743	<0.01
BERS, β_{03}	-0.79	0.037	-21.34	5743	<0.01
CGSQ, β_{04}	19.72	0.677	29.12	5743	<0.01
FAD, β_{05}	-3.81	1.242	3.07	5743	0.003
RACE, β_{06}	0.74	1.056	0.70	5743	0.583

Table 14 (Continued)

Fixed Effect	Coefficient	Standard Error	t Ratio	df	p Value
Model for first order growth, π_{1i}					
Base, β_{10}	-25.83	5.889	-4.386	5743	<0.01
Age, β_{11}	-0.46	0.257	-1.81	5743	0.070
Sex, β_{12}	-0.56	1.640	-0.34	5743	0.734
BERS, β_{13}	0.19	0.064	3.02	5743	0.003
CGSQ, β_{14}	-7.90	1.344	-5.88	5743	<0.01
FAD, β_{15}	1.15	1.670	0.69	5743	0.492
RACE, β_{16}	-7.07	1.403	-5.04	5743	<0.01
Latent Initial CAFAS, β_{17}	0.13	0.050	2.50	5743	0.013
Model for second order growth, π_{2i}					
Base, β_{20}	6.08	1.425	4.27	5743	<0.01
Age, β_{21}	0.01	0.067	0.12	5743	0.903
Sex, β_{22}	-0.002	0.426	-0.01	5743	0.996
BERS, β_{23}	-0.04	0.015	-2.21	5743	0.027
CGSQ, β_{24}	1.70	0.337	5.03	5743	<0.01
FAD, β_{25}	-0.41	0.436	-0.95	5743	0.343
RACE, β_{26}	1.54	0.367	4.21	5743	<0.01
Latent Initial CAFAS, β_{27}	-0.04	0.012	-3.53	5743	0.001

Table 14 (Continued)

Random Effect	Standard Deviation	Variance Component	df	χ^2	p Value
Initial status, τ_{00}	26.35	694.38	3075	5405.72	<0.01
First order growth, τ_{11}	17.61	309.97			
Second order growth, τ_{22}	3.65	13.32			
Level-1 error, e_{ti}	30.41	924.58			

As depicted in Table 14, behavioral and emotional strengths, caregiver strain, family functioning, age, and sex significantly predicted differences in functional impairments at intake into services. Controlling for the other explanatory variables in the model, behavioral and emotional strengths significantly predicted differences in functional impairments at intake into services. Children with fewer strengths displayed greater levels of functional impairments at intake into services. Controlling for other explanatory variables, both caregiver strain and family functioning were related to functional impairment at intake into services. Children whose parents experienced greater levels of strain displayed greater levels of functional impairment at intake. Greater levels of functional impairments were also associated with greater levels of family dysfunction. Age was positively associated with functional impairment at intake into services, and hence older children displayed greater levels of functional impairment. Interestingly, the association between age and clinical impairment (on the CBCL Total Problem scores) was in the opposite direction. Sex was negatively related to functional impairments at intake, after controlling for other variables in the model. Similar to findings regarding the relationship between sex and clinical impairment, males displayed

greater levels of functional impairments at intake into services. Race was not significantly related to functional impairments at intake into services. Because age, sex, and family functioning were not significant predictors of either instantaneous growth or rate of deceleration, graphical representations for these explanatory variables were not generated.

Table 14 also displays the effects of the predictor variables on instantaneous growth rates. Recall that lower scores on the CAFAS reflect better functional status and thus negative instantaneous growth is expected and indicates improvement in functional outcomes. Results from the unconditional model (see Table 13) indicated that children made significant improvements (instantaneous growth) in functional status over time (decreasing CAFAS Total Scores) (β_{10} = -15.69, t = -23.26, $p < 0.01$). In the latent variable conditional model, behavioral and emotional strengths ($p = 0.003$), in addition to caregiver strain ($p < 0.01$) and race ($p < 0.01$) were significant predictors of differences in instantaneous growth rates. Latent initial status was also a significant predictor of first order growth (β_{17} = 0.13, t = 2.50, p = 0.013). Family functioning was not a significant predictor of instantaneous growth (β_{15} = 1.15, t = 0.69, p = 0.492), nor were age or sex (t = -1.81, t = -0.34, respectively).

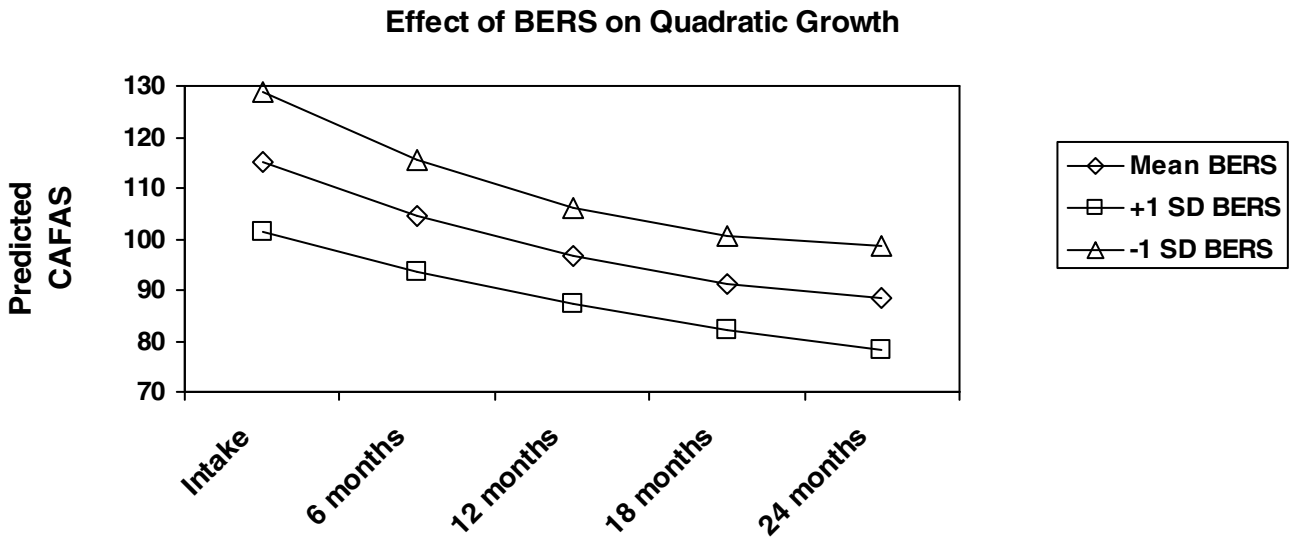
Table 14 depicts the effects of the predictor variables on rates of deceleration (curvature) across time. As a reminder, results from the unconditional model presented in Table 13 revealed that there were significant rates of deceleration over time, suggesting greater improvement in functional outcomes early on with more gradual rates of improvement over increasing time (β_{20} = 2.14, t = 12.21, $p < 0.01$). The positive point

estimate for second order growth denotes that the general decrease in the CAFAS scores across time becomes smaller in the latter months of the study. Results from the Level 2 latent variable conditional model indicate that, controlling for other variables in the model including adjusting for differences in latent initial status, behavioral and emotional strengths ($p = 0.027$), caregiver strain ($p < 0.01$), and race ($p < 0.01$) were significant predictors of deceleration rates. Latent initial status was also a significant predictor of second order growth ($\beta_{27} = 0.04$, $t = -3.53$, $p = 0.001$). Age, sex, and family functioning were not significant predictors of deceleration rates ($t = 0.12$, $t = -0.01$, $t = -0.95$, respectively).

Table 14 indicated that children's behavioral and emotional strengths were significantly related to initial status, as well as the growth trajectories. Figure 8 illustrates the initial status and the expected growth trajectories for the CAFAS for individuals who had an average BERS Strength Quotient, one standard deviation above the average, and one standard deviation below the average amount of strengths. All other predictor variables in the model are held constant at their means for continuous variables or at a value of zero for the dichotomous variables. As displayed in the plot, each of these groups of children improved throughout the course of system of care services, with the greatest improvement occurring from intake to 6 months. At each time point, individuals who possessed greater behavioral and emotional strengths displayed better functional outcomes on the CAFAS than those individual with fewer strengths. The figure also illustrates the different rate of deceleration (curvature) over time for the different groups, with those individuals who have scored lower on the BERS having greater deceleration over time. Further, while the differences in the CAFAS scores at each time point varied

across time for individuals who possessed different amounts of behavioral and emotional strengths, the standardized differences were small to moderate at each time point. The standardized differences were the greatest at intake (0.37), were the smallest at 12 and 18 months (0.25), and were 0.28 at the last time point. Again, this pattern is indicative of greater initial functional improvements that tend to wear off across time for those children with fewer strengths.

Figure 8. Effect of BERS-SQ at Intake on Improvement in Functional Outcomes



Caregiver strain was a significant predictor of initial status and the growth trajectories. Figure 9 displays the growth trajectories on the CAFAS Total Score for individuals having the average caregiver strain, and one standard deviation above and below the average caregiver strain. As illustrated in the graph, all three groups of children experienced improved functional outcomes throughout the course of the twenty-four months, with the greatest improvement occurring form intake to six months. Like

the findings from the models of clinical outcomes, at each time point children whose caregivers reported experiencing greater strain displayed greater functional impairments. The standardized differences between the CAFAS Total Scores at each time point for the different groups were small to moderate at each time point. More specifically, the standardized differences were the largest at intake (0.48), were the smallest at 18 months (0.25), and were 0.37 at 24 months.

Figure 9. Effect of CGSQ-GS at Intake on Improvement in Functional Outcomes

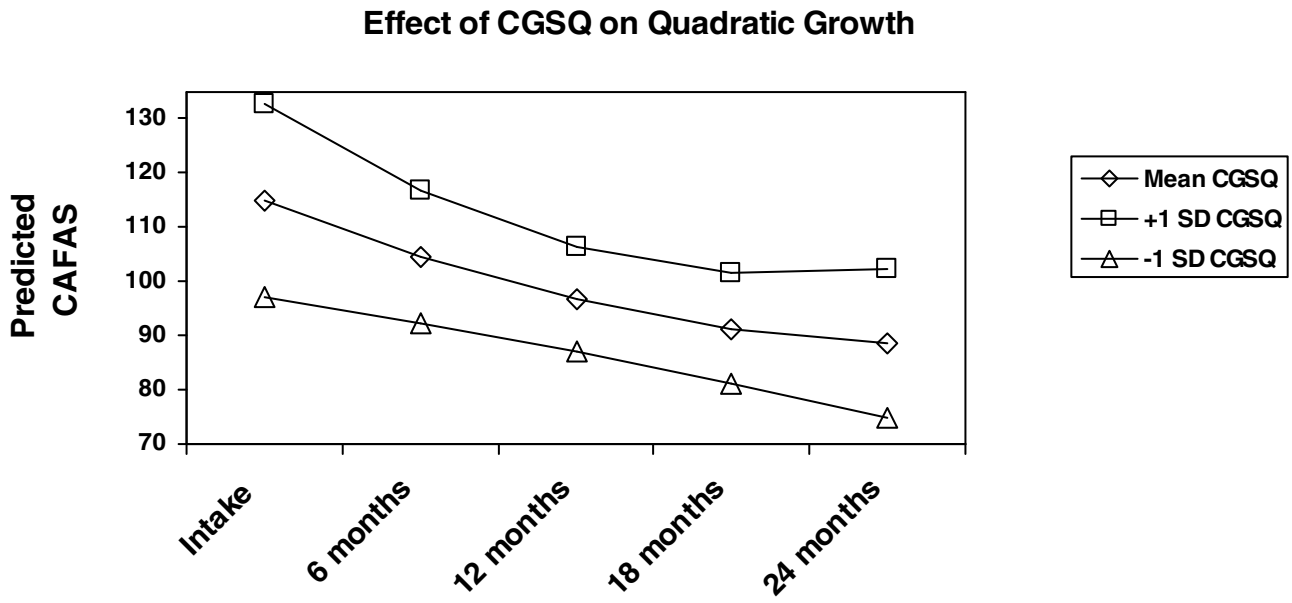


Table 14 indicated that race was also a significant predictor of instantaneous growth and deceleration rate. Race, however, was not a significant predictor of initial status. Initial status and the expected growth trajectories for the CAFAS for both non-white and white racial groups are displayed in Figure 10. The graph shows that both racial groups improved over the course of system of care services, and like the previous

findings the greatest improvement occurred between intake and 6 months. Although both racial groups start out with similar levels of functional impairments, the graph clearly indicates that white children improved at a much faster rate. Standardized differences in CAFAS scores at each time point varied, with the differences being relatively small. At intake, the standardized differences were the smallest (0.02), were the largest at 12 months (0.23), and were 0.12 at 24 months.

Figure 10. Effect of RACE on Improvement in Functional Outcomes

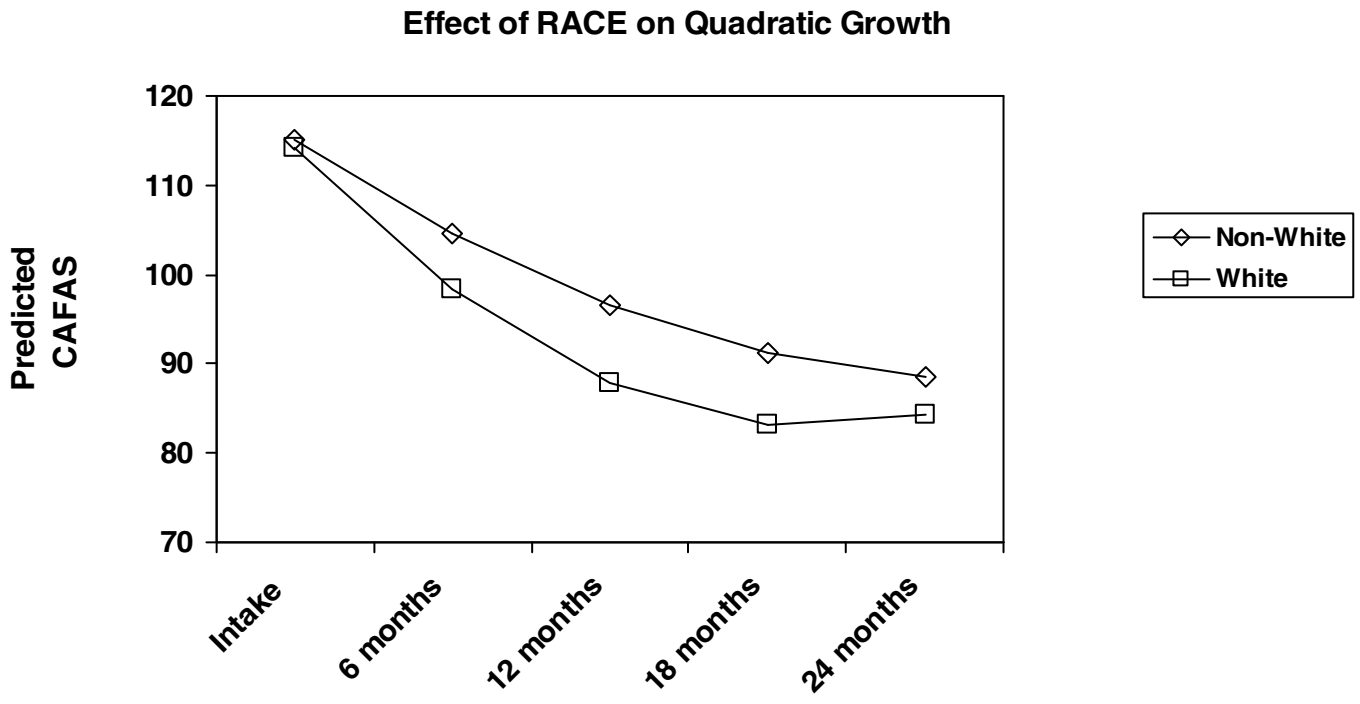


Table 15 provides an estimate of effect size for the entire latent variable quadratic growth model for functional outcomes on the CAFAS. The inclusion of all the predictors in the model accounts for 49.57% of the individual variability in functional impairment at intake into services, 17.60% of the individual variability in instantaneous growth, and 15.96% of the individual variation in rate of deceleration. The estimates of effect size for

each of the parameters represents a much smaller amount of variance accounted for by the inclusion of the explanatory variables compared to the models for clinical impairments.

Table 15

Amount of Variance Explained in Initial Status and First and Second Order Growth for CAFAS as a Result of All Predictor Variables

Model	Initial Status Variance, (τ_{00})	First Order Growth Variance, (τ_{11})	Second Order Growth Variance, (τ_{22})
Unconditional Model	1376.82	376.19	15.85
Latent Conditional Model	694.38	309.97	13.32
Proportion of Variance Explained	49.57%	17.60%	15.96%

Chapter 5: Discussion

This study explored differences in rates of growth across time in clinical and functional outcomes as a function of various individual characteristics (behavioral and emotional strengths, caregiver strain, family functioning, and demographic variables) for children with serious emotional disturbances who received system of care services. This study also examined whether these variables predicted differences in clinical and functional impairments at intake into services. This chapter presents a summary and discussion of the results from the study. The limitations of the study and future directions for research are also addressed. Finally, the implications of the study for the provision of services of children with serious emotional disturbances are reviewed.

SUMMARY AND DISCUSSION OF RESULTS

Overall, the results of this study indicate that children with serious emotional disturbances who receive some combination of system of care services display improved clinical and functional outcomes over time, further adding to the existing literature supporting the effectiveness of the system of care approach to service delivery (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003; Manteuffel et al., 2002). A general pattern of growth over time emerged, with the greatest improvement in both clinical and functional outcomes occurring between intake into system of care services and the first 6 month follow-up. The Level 2 unconditional models for clinical and functional outcomes revealed that there was also considerable

variability in individual rates of improvement, warranting additional analyses including explanatory variables at Level 2 to account for this variability.

The results from the conditional models conducted in the study further suggest that several individual characteristics influence not only the severity of clinical and functional impairments at intake into services, but also differences in such outcomes over time as reflected by differences in growth trajectories. What is more, children entering system of care services who are more "disadvantaged" (i.e. have greater levels of clinical and functional impairments, fewer strengths, greater caregiver strain, etc.) tend to improve more within the first six months of services, appearing to "catch up" over time to individuals who enter services more advantaged. However, this more rapid growth levels off more quickly over time for those who are more impaired, suggesting that there is a greater erosion of the effect of system of care services for the more impaired children. Overall, regardless of initial impairment, children who participated in system of care services displayed significantly improved outcomes across the two year time period. What follows is a discussion of each of the hypotheses regarding the effect of each of the predictor variables on individual growth trajectories and initial status for both clinical and functional outcomes.

Emotional and Behavioral Strengths and Clinical and Functional Status

It was hypothesized that children with greater behavioral and emotional strengths at intake into system of care services would display better growth rates on measures of clinical and functional outcomes as measured by change over time on the CBCL Total Problem scale and CAFAS Total Score, respectively. Thus, the results from the current study did partially support the hypothesis that behavioral and emotional strengths would

predict differences in growth rates for children with serious emotional disturbances. However, the results were in the opposite direction of what was expected.

Children's behavioral and emotional strengths were predictive of both instantaneous growth and rate of deceleration for clinical outcomes on the CBCL Total Problem scale. Although children who possessed greater strengths displayed better clinical outcomes at every time point, those children with fewer strengths displayed greater instantaneous growth and greater rates of deceleration. Thus, children who possess fewer behavioral and emotional strengths at intake had greater rates of improvement within the first six months, but this rapid improvement leveled off more rapidly such that these children displayed similar levels of clinical outcomes at the two-year follow-up. Similar results were found for the models predicting individual growth trajectories for functional outcomes on the CAFAS Total Score.

It was expected that children's behavioral and emotional strengths would be related to initial levels of clinical and functional impairments at intake into system of care services. This hypothesis was supported as scores on the BERS were negatively related to initial scores on the CBCL, as well as negatively related to initial scores on the CAFAS, in each of the respective Level 2 latent variable conditional models. Thus, children who possess fewer behavioral and emotional strengths displayed greater levels of clinical and functional impairments at intake into services. This finding is consistent with previous systems of care research which demonstrated an inverse relationship between children's strengths and impairment at intake, with fewer strengths being associated with greater impairment (Center for Mental Health Services, 1999; 2000; 2001; Oswald, Cohen, Best, Jenson, & Lyons, 2001).

As mentioned previously, a strengths-based perspective is a core value of systems of care, with the underlying assumption that all children, regardless of their level of clinical or functional impairments, possess various internal resources or strengths (Holden et al., 2003; Stroul, 2003; Stroul & Friedman, 1986). It has also been suggested that children's inner resources (e.g. behavioral and emotional strengths, adaptive skills, competencies, coping resources, etc) play a role in both current adjustment and long-term outcomes (Compas 1987; Epstein & Sharma, 1998; Kazdin, 1995b; Levy-Shiff et al., 1998). The finding of a significant relationship between strengths and clinical and functional impairments at intake very broadly supports the notion that behavioral and emotional strengths are related to current adjustment. Thus, it may be that a paucity of behavioral and emotional strengths may further exacerbate children's psychiatric difficulties, leading to greater clinical and functional impairments at intake into system of care services.

In the current study children with serious emotional disturbances, regardless of their amount of strengths, displayed clinical and functional improvements over the two years. A somewhat surprising finding was that children with fewer strengths at intake into system of care services displayed faster rates of growth within the first six months, while also displaying greater deceleration over time. Given the dearth of available research exploring the impact of children's behavioral and emotional strengths on clinical and functional outcomes, one can only speculate as to the reasons for this result. One possibility is that those children who enter system of care services with fewer behavioral and emotional strengths have the most room to improve, accounting for their more rapid growth within the first six months. Because children with fewer strengths were more

impaired at intake into services, they may have benefited more from system of care services than children who were less impaired and had greater strengths, particularly in the first six months of services.

Another plausible explanation for faster initial growth rates for children with fewer strengths is that children's strengths may be explicitly targeted through system of care services. In the treatment of children with serious emotional disturbances, although intervention is often initially aimed at decreasing areas of dysfunction (e.g. disruptive behaviors, mood dysregulation, etc.), intervention also frequently focuses on improving children's assets or prosocial behaviors (Durlak & McGlinchey, 1999). For example, there are a variety of interventions designed to build children's social skills and self-confidence. Many traditional (e.g. individual, family and group therapy, inpatient hospitalization, etc.) and more innovative (e.g. after school programs, summer camps, recreational programs) system of care services may improve children's behavioral and emotional strengths. For example, Interpersonal Strength and Intrapersonal Strength might be expected to increase as children develop more effective social skills and improve their sense of self-worth. Family Involvement may also improve as children's level of family dysfunction decreases over time. This is consistent with system of care research, which has consistently demonstrated that children do display significant improvement in behavioral and emotional strengths over time (Center for Mental Health Services, 1999; 2000; 2001; Holden et al., 2003). Thus, it seems likely that many of the system of care services explicitly target and build upon children's existing behavioral and emotional strengths, resulting in greater improvement in clinical and functional outcomes. As these children develop greater strengths and become less impaired, system

of care services become somewhat less effective for this group of children resulting in a slower rate of improvement over increasing time. System of care services appear to be particularly effective between intake and the first six month follow-up for those children with fewer behavioral and emotional strengths at intake. Thus, it may be that system of care services level the playing field for those who are more impaired, such that over time there are only minimal differences in outcomes for children who possess varying amounts of strengths at intake.

Finally it is also possible that this pattern of more rapid initial growth for children with fewer strengths is related to differences in the type or amount of systems of care services they received. It seems logical that those children who are more impaired at intake into system of care services are more likely to receive more services, and possibly more intensive services. Studies of services utilization patterns in systems of care have in fact demonstrated that children with greater clinical and functional impairments use more services, receive more intensive services, and participate in services for longer periods of time (Center for Mental Health Services, 1999; 2000; Doucette-Gates, Hodges, & Liao, 1999; Lambert, Brannan, Breda, Heflinger, & Bickman, 1998). Consistent with previous system of care research (Center for Mental Health Services, 1999; 2000; 2001), this study revealed that behavioral and emotional strengths were predictive of level of impairment at intake into services. It seems reasonable then that those children with fewer behavioral and emotional strengths, and thus greater levels of clinical and functional impairment at intake into services, may have received either more services or more intensive services. This is in line with the study of Oswald et al., (2001) which found that children with fewer behavioral and emotional strengths were more likely to receive restrictive services.

As children become less clinically and functionally impaired, they may require fewer or less restrictive services, and thus there is a more rapid drop off in improvement for those who are initially more impaired. Therefore, the faster growth rates and more rapid rate of deceleration for children with fewer strengths may be explained, at least in part, by the observation that these children likely received different types or amounts of services initially, with these services decreasing in frequency or intensity as these children became less impaired over time. Because service utilization variables were not included in the current study this possibility cannot be tested.

Caregiver and Family Variables and Clinical and Functional Status

Family Functioning

It was expected that family functioning would predict differences in rates of improvement in clinical and functional outcomes over time, with poorer growth rates for those children with greater levels of family dysfunction. This hypothesis was not supported for either clinical or functional outcomes; family functioning did not predict differences in either instantaneous growth or rate of deceleration for changes in the CBCL or the CAFAS. This finding is particularly interesting in light of previous research in the field of child psychotherapy which has consistently demonstrated that family functioning is a potent predictor of treatment outcomes (Crawford & Manassis, 2001; Friedman et al., 1995; Kazdin, 1995a; Phillips et al., 2000).

The hypothesis regarding the relationship between family functioning and initial levels of clinical and functional impairments was supported. It was expected that children with greater levels of impairment would also display greater levels of family dysfunction. The results from the current study revealed a relationship between family

functioning and both clinical and functional status at intake into system of care services, with greater family dysfunction being associated with greater levels of impairment. Well-documented research in the areas of developmental psychopathology and risk and resiliency have demonstrated a link between poor family relationships, family functioning, and children's subsequent behavioral and emotional adjustment (Abidin et al., 1992; Elgar et al., 2003; Kazdin, 1995b; Masten et al., 1999; Rutter, 1985). Moreover, within systems of care, research has demonstrated that better family functioning was associated with lower levels of clinical and functional impairments at intake into services (Center for Mental Health Services, 2001). Thus, the results from the current study provide additional support for these lines of research suggesting that family dysfunction does impact children's adjustment.

There are a number of possible explanations which may account for the lack of significant findings regarding the relationship between family functioning and differences in growth trajectories. One possible explanation may be due to the heterogeneity of system of care sample, as well as the variety of services the children likely received. The literature on which the hypothesis regarding family functioning and differences in growth rates was based utilized very specific diagnostic categories or specific treatment interventions. For example, one study which found that family dysfunction was predictive of poorer treatment outcomes utilized a sample of youth between the ages of 7-13 who were referred for disruptive behavioral disorders (Kazdin, 1995a). This same study employed the use of manualized cognitive behavioral and parent training interventions. Similarly, Crawford and Manassis's (2001) study, which also found a significant relationship between family functioning and treatment outcomes, included

only children between the ages of 8 to 12 who were diagnosed with an anxiety disorder (e.g. generalized anxiety disorder, separation anxiety disorder, simple and social phobias, panic disorder, trichotillomania, and selective mutism). Like Kazdin's (1995a) study, the researchers utilized a manualized treatment intervention.

Unlike much of the research in field of child psychotherapy, the system of care sample consisted of a highly diverse group of children with serious emotional disturbances who received an array of various services and were not limited to individual or group therapy interventions. Previous research regarding diagnostic information for the children who participate in systems of care has revealed these children receive a variety of diagnostic labels, with many of the youth receiving multiple diagnoses (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al, 2003). Although the most prevalent diagnoses were in the realm of disruptive behavioral disorders (i.e. attention deficit-hyperactivity disorder, oppositional defiant disorder, conduct disorder), many children within systems of care met diagnostic criteria for mood disorders (including major depressive disorder or bipolar disorder), anxiety disorders, eating disorders, learning disabilities, substance use disorders, pervasive developmental disorders, or psychotic disorders.

Moreover, as has been described previously, the system of care is philosophical approach to service delivery rather than a discrete treatment intervention. Children within systems of care receive a variety of services, which may or may not include individual therapy services. System of care principles dictate that children should receive an individualized combination of services that best meets their unique needs (Stroul, 2003; Stroul & Friedman, 1986). Thus some children may require more restrictive

services including inpatient or residential care, while others may require case management services only. It is possible that the relationship between family functioning and clinical and functional outcomes may vary across children's diagnostic categories or across the type of services or interventions children receive. In the current study, diagnostic category or types of services were not controlled for in the growth curve models which may have precluded finding a significant relationship between family functioning and differences in growth rates on measures of clinical and functional outcomes.

Another possible explanation for the lack of significant findings may be related to the use of global measures of family functioning completed by the child's primary caregiver. In the current study, only the General Functioning subscale of the FAD was used as a predictor of growth trajectories. Although the General Functioning subscale provides a general measure of a family's health, it may be that more specific aspects of a family's functioning is related to differences in growth trajectories. It is possible that specific subscales of the FAD (e.g. Affective Responsiveness, Affective Involvement, Behavioral Control) may have revealed differences in either instantaneous growth or rate of deceleration. In addition, previous research has found that youth's reports of family functioning differs from caregiver's report (Center for Mental Health Services, 2000; 2001; Holden et al., 2003). The FAD can be completed by youth who are at least 12 years old, however because this study included youth younger that 12 years old, it was decided to utilize only caregiver report of family functioning. It is possible that the inclusion of youth reports of family functioning may have yielded different results.

Finally it is conceivable that after controlling for the other variables in the model that family functioning was not a significant predictor of clinical and functional outcomes over time. In the current study, family functioning was correlated most strongly with caregiver strain, as well as with behavioral and emotional strengths, both of which were found to be predictive of both instantaneous growth and rates of deceleration for clinical and functional outcomes across time. It may have been that after including and controlling for these predictor variables, as well as the other Level 2 explanatory variables, that family functioning was simply not predictive of differences in growth trajectories.

Caregiver Strain

Caregiver strain is a construct that has received a considerable amount of attention in systems of care research. However this is the first known study to investigate the role of caregiver strain in relation to differences in clinical and functional outcomes over time. It was hypothesized that caregiver strain would predict differences in growth rates on measures of clinical and functional outcomes for children who participate in system of care services, with greater caregiver strain being associated with poorer rates of growth. However it was found that differences in growth trajectories were explained by differences in caregiver strain, only in the opposite direction of what was expected.

Caregiver strain significantly predicted differences in instantaneous growth and deceleration rates for both clinical outcomes on the CBCL, as well as functional outcomes on the CAFAS. At every time point, children with greater caregiver strain demonstrated greater levels of clinical impairments. However, those children with greater caregiver strain had faster rates of instantaneous growth and greater rates of

deceleration than those children with less caregiver strain. Thus, children whose caregiver reported greater caregiver strain had more improvement in clinical and functional outcomes within the first six months, with this more rapid improvement in outcomes leveling off more rapidly over increasing time. Thus, similar to the results regarding the relationship between behavioral and emotional strengths and clinical outcomes, at the two year follow-up there were only minimal differences in scores on the CBCL between those children with greater caregiver strain and those children whose caregivers experienced lesser burden.

There was a similar pattern in the growth trajectories for functional outcomes on the CAFAS Total Score, with greater caregiver strain being associated with faster instantaneous growth and greater rate of deceleration. However there was greater disparity between those children with greater caregiver strain and those with less caregiver strain at the two-year follow-up. Despite their faster initial growth rates, children with greater caregiver strain continued to display average functional impairments in the marked range, whereas those with less caregiver strain displayed average scores in the moderate range of functional impairment at the two-year follow-up.

It was also expected that caregiver strain would significantly predict differences in initial levels of clinical and functional impairment at intake into system of care services. The results of this study did support this hypothesis, with greater caregiver strain being related to greater initial scores on measures clinical and functional impairments, in each of the respective Level 2 latent variable conditional models. This finding is consistent with previous systems of care research which found that children whose caregivers reported greater caregiver strain displayed greater impairment on both

the CBCL and the CAFAS at intake into system of care services (Center for Mental Health Services, 1999; 2000; 2001).

The finding that children with greater clinical and functional impairments at intake had caregivers who reported greater levels of caregiver strain is consistent with evidence that suggests that caring for children with serious emotional disturbances can be particularly stressful (Angold et al., 1998; Brannan, 2003; Brannan & Heflinger, 2002; Brannan et al., 1997). In fact, one study in particular found that children's behavioral and emotional symptoms, rather than family resources, general life stressors, or general parental distress, were the most powerful predictor of caregiver strain (Brannan & Heflinger, 2002). The significant relationship between caregiver strain and the severity of children's level impairment also generally supports research in the field of developmental psychopathology which has revealed a strong relationship between parental functioning and children's behavioral and emotional functioning (Abidin et al., 1992; Billings & Moos, 1986; Cicchetti, 1994; Elgar et al., 2003; Kazdin, 1995b).

Several possibilities may account for the unexpected finding that children with greater caregiver strain demonstrated greater growth trajectories. There is a growing body of evidence which indicates caregiver strain impacts children's service utilization in systems of care (Angold et al., 1998; Brannan, Heflinger, & Foster, 2003; Farmer, Burns, Angold, & Costenello, 1997; Foster, 1998; Lambert et al., 1998). Children's whose caregivers experience greater caregiver strain are likely to receive more services in general (Farmer et al., 1997), more intensive services (e.g., residential or day treatment services) (Lambert et al., 1998), and a combination of both inpatient and outpatient services (Brannan et al., 2003). In addition, the length of time in treatment has also been

linked to greater caregiver strain (Foster, 1998). These lines of research suggest that children whose caregivers report experiencing greater strain will more likely have greater contact with the mental health system in general. Thus, it may that those children whose caregivers reported greater caregiver strain received more of, or different types of, services, or received longer courses of treatment, which contributed to these children's greater initial growth rates. As levels of clinical and functional impairments, in addition to caregiver strain, decrease children's service utilization patterns may reflect such improvements. System of care services may become less restrictive and or less frequent as children improve, and thus there is a more rapid leveling off in improvement for those who are more impaired at intake. Service utilization variables were not included in the current study so it was not possible to explore any potential relationships between caregiver strain, service utilization, and growth trajectories.

It is also possible that because children with greater caregiver strain were more impaired at intake into services, that they, like children with fewer behavioral and emotional strengths, had more potential for improvement within the first six months of services. Those children with greater caregiver strain, and hence greater levels of impairment at intake, may benefit more from system of care services initially, despite remaining more impaired overall at each time point. It is important to again point out that although children with greater caregiver strain at intake into services displayed faster rates of growth, they were still more clinically and functionally impaired than those children whose caregivers reported less caregiver strain at every time point in the study. Therefore caregiver strain is not only a powerful indicator of impairment at intake into services, but it also an important predictor of differences in outcomes over time. Further

research including service utilization variables is needed to gain additional insight into the relationship between caregiver strain and clinical and functional outcomes for children in systems of care.

Demographic Variables and Clinical and Functional Status

This study sought to explore the relationship between age, sex, and race and differences in growth rates in clinical and functional outcomes over time for children who participate in system of care services. This study also explored the role these variables played in predicting clinical and functional impairments at intake into system of care services. Since previous system of care research has found evidence for sex and age differences, but not racial differences, in levels of impairment at intake (Center for Mental Health Services, 1999; 2000; 2001) it was hypothesized that age and sex would significantly predict differences in growth trajectories, while race would not be a significant predictor. Results from the Level 2 latent variable conditional model for clinical outcomes on the CBCL Total Problem scale revealed that age, sex, and race were significant predictors of growth for children who participated in system of care services. For the Level 2 model predicting differences in growth rates for functional outcomes on the CAFAS Total Score, race was the only significant predictor of the growth trajectories. Thus, the results partially supported the hypothesis regarding demographic variables and growth trajectories.

Children's age and race were significant predictors of both instantaneous growth and rate of deceleration for clinical outcomes on the CBCL. Similar to the findings regarding strengths and caregiver strain, while younger children were more clinically impaired at each time point, younger children displayed greater initial growth rates and

greater rates of deceleration than their older counterparts. Likewise, children regardless of their racial category, made significant improvements in clinical outcomes over time. However, despite being more clinically impaired at each time point, white children displayed greater growth trajectories, both greater instantaneous growth and greater rates of deceleration. Again there was a similar effect of "catching up" for those who were more disadvantaged (younger or white) at intake into services. These "disadvantaged" children had greater initial growth rates, but this rapid rate of improvement decreased more rapidly over time. Therefore, younger children and older children differed in levels of clinical impairment only minimally at the two-year follow-up, as did white and non-white children.

Sex was also a significant predictor of instantaneous growth, but not rate of deceleration, for clinical outcomes on the CBCL Total Problems scale. Males displayed more rapid rates of growth over time, but their rate of deceleration was similar to that of females. Despite entering system of care services with greater levels of clinical impairments, at the 12 month time point males displayed better clinical outcomes compared to females, and this patterned remained throughout the two-year follow-up. However it is important to point out that these differences between males and females were quite small (effect sizes ranged from 0.02 to 0.11 across the different time points).

A different pattern of significant predictors occurred for functional outcomes on the CAFAS. Neither age nor sex were significant predictors of the growth trajectories. Race, however, did significantly predict instantaneous growth, as well as rate of deceleration. Though both racial groups displayed improved functional status over time, children who were white had faster initial growth in the first six months and greater

deceleration across time. Again, children in both racial groups displayed similar levels of functional outcomes at the two-year follow-up, with differences between these groups being quite small.

It was also expected that age and sex would be related to initial levels of clinical and functional impairments, while race would not be a significant predictor of impairments at intake. This hypothesis was partially supported in the model predicting clinical impairments on the CBCL Total Problems scale at intake into services. Younger children were more clinically impaired at intake. Likewise, males were slightly more clinically impaired, however this difference was extremely small (effect size of 0.08 at intake) though statistically significant. Contrary to expectations, race was a significant predictor of initial levels of clinical impairments with children who were white demonstrating slightly greater levels of clinical impairments compared to their non-white counterparts. Consistent with expectations, age and sex, but not race, significantly predict differences in functional impairments on the CAFAS at intake into services. Unlike the relationship between age and clinical status, older children were more functionally impaired compared to their younger counterparts. Males were also more functionally impaired at intake into services compared to females.

Previous systems of care research have not consistently found significant sex differences in clinical impairments on the CBCL at intake into services. One study found that girls were more clinically impaired (Center for Mental Health Services, 2000), while other data failed to find significant sex differences (Center for Mental Health Services, 1999; 2001). Results from this study are not consistent with the previous studies, as males were found to exhibit greater clinical impairments on the CBCL. However it is

important to point out that, although statistically significant, the differences between males and females levels of clinical impairment on the CBCL were extremely small. The finding that boys exhibited greater levels of functional impairments on the CAFAS is consistent with previous research (Center for Mental Health Services, 1999; 2000; 2001). The relationships between age and clinical and functional impairments are also consistent with previous systems of care data (Center for Mental Health Services, 1999; 2000; 2001); while younger children exhibit greater clinical impairments at intake, older children display greater functional impairment at intake into services. Racial differences in clinical and functional impairments have not been reported in any of the Annual Reports to Congress (Center for Mental Health Services, 1999; 2000; 2001) and thus the finding that white children were more clinically impaired at intake into services was somewhat surprising. However, again the difference in clinical impairments at intake between white and non-white racial groups was quite small, providing little clinical utility.

Discussion of demographic findings

Similar to results regarding the impact of strengths and caregiver strain, children who participated in system of care services exhibited improvement in clinical outcomes over time, with the greatest improvement occurring in the first six months of services. The finding that boys displayed somewhat faster initial rates of growth compared to girls may be related to service utilization. Because boys were more clinically and functionally impaired at intake into services, they may have received a greater number of services or receive more intensive or restrictive services. In addition, because boys were more impaired at intake, they may have benefited more in the first six months. Previous child

psychotherapy research has found that the role of gender in moderating therapeutic outcomes interacts with other variables, including age and diagnosis (Phillips et al. 2000; Weisz et al., 1995). Thus, sex differences in growth rates may actually be related to other variables. Finally, this statistically significant relationship between sex and instantaneous growth rates on the CBCL may also simply be due to a large sample size. This is a very realistic possibility in light of the fact the effect sizes for the levels of clinical impairment between males and females is minimal at each of the time points.

Age was found to be a significant predictor of both instantaneous growth and rate of deceleration for clinical outcomes on the CBCL. However, age did not predict differences in growth trajectories for functional outcomes on the CAFAS. Consistent with the general pattern of greater growth trajectories for those who were more clinically impaired at intake, younger children exhibited faster initial improvement within the first six months, with this leveling off more rapidly over time. A similar service utilization explanation may account for this finding. Thus, those children who are more impaired at intake may receive different types of or more frequent services. As levels of clinical impairments improve for younger children and become more similar to the level of older children's impairment, services utilization patterns may also become more similar. A more interesting finding is that at each time point, older children displayed better clinical outcomes. This is consistent with the child psychotherapy outcome studies which have found that adolescents exhibit greater therapeutic gains compared to younger children (Kazdin & Crowley, 1997; Weisz et al., 1995).

Surprisingly, race was a significant predictor of growth trajectories for both clinical and functional outcomes over time. Despite being more impaired at intake, white

children exhibited faster initial rates of clinical and functional impairments within the first six months of services. While this pattern was true for both clinical and functional outcomes, the effect of race on functional outcomes was more dramatic, as evidenced by the greater effect sizes. White children also displayed greater deceleration over time. A similar explanation may account for the fact that white children benefited more from system of care services within the first six month. That is, because white children were more impaired at intake, they had more room to improve initially, and they may have received more services.

A particularly intriguing finding was the greater disparity in functional outcomes on the CAFAS for white and non-white racial groups, with non-white children displaying greater functional impairment. One of the core values of systems of care is that services for children with serious emotional disturbances should be culturally competent (Stroul, 2003; Stroul & Friedman, 1986). However, research has found that systems of care grant communities consistently receive lower scores on indicators of cultural competence (Holden et al., 2003), possibly accounting for the poorer functional outcomes for non-white racial groups. Norms regarding appropriate behaviors, roles, and functioning are culturally mediated, and therefore may vary widely among different cultures, including different racial groups. The way clinicians understand and address dysfunctional emotional and behavioral patterns are also influenced by cultural variables (Dixon, 2002; Pumariega, 2003), potentially affecting the way minority children experience system of care services. In addition, the information to complete the CAFAS is obtained via structured interviews with the child's caregiver. The interviewer's own cultural view of appropriate or adaptive functioning may create bias in the ratings of functional

impairment. Despite poorer functional outcomes compared to white children, non-white children displayed improvements in functional and clinical outcomes over time, indicating that the system of care services leads to improved outcomes, regardless of race.

This study attempted to clarify the role of demographic variables on clinical and functional outcomes. However, the relationship between demographic variables continues to be somewhat unclear. The literature used to support the hypotheses for the inclusion of demographic variables came primarily from child psychotherapy outcome research. Since children within systems of care receive a wide array of services, which may or may not include traditional psychotherapy, variables that predict therapeutic outcomes may not be the same ones that predict clinical and functional outcomes in systems of care. In addition, the current study used different methodology than that used by much of the child psychotherapy outcome research. Much of the child psychotherapy research that has explored the role of predictor variables on therapeutic outcomes measured outcomes at only two time points, using a pre-posttest design. In contrast, this study investigated the role of explanatory variables on *growth trajectories* over the course of time, rather than a single time point.

STUDY LIMITATIONS

Despite the fact that many of the hypotheses were supported, there were several limitations inherent in the current study. One of the primary limitations was the heterogeneity of the services each child received. Because a principle of the system of care approach to service delivery is that children should receive an individualized

package of services to meet their unique needs, children participating in systems of care receive different combinations of services, ranging in frequency, intensity, and duration. One child may have received only case management services or assessment services, while another child may have received individual therapy and treatment foster care services in addition to case management. A different child may have received inpatient hospitalization in addition to the above services. Therefore, some children may have received significantly more system of care services compared to other children.

In addition, some children may have also received more service components. It is possible that there were differences in rates of improvement for those children who received more services or different service components. It would be difficult, if not impossible, to control for different services, given the infinite number of possible service combinations. Moreover, the length of stay in system of care services varies widely. Children in the child family outcome portion of the national evaluation were followed regardless of whether they continued to receive services. Therefore, some children in the current study may have participated in system of care services for the entire two-year follow-up period, while other children may have received services only within the first six months. Because service variables were not included in the analyses, it was not possible to determine how patterns of services utilization were related to study outcomes.

It is also unclear whether certain types of services, or service components, account for the improvements in clinical and functional outcomes over time. The overall effectiveness of individual service components has not been well established (Kutash & Rivera, 1996). Therefore, it may be that certain service components or service combinations are more effective than others. For example, child psychotherapy outcome

literature suggests that behavioral or cognitive-behavioral interventions lead to better therapeutic outcomes (Casey & Berman, 1985; Durlak & McGlinchey, 1999; Weisz et al., 1987). Though system of care services include more than traditional outpatient mental health services (e.g. individual, family, and group therapy), it is possible that those children who received services that included structured interventions had better rates of improvement over time. Consistent with the system of care philosophy, children should receive effective services. Including service variables would provide a greater understanding of how services influence clinical and functional outcomes in systems of care and clarify relationships between predictor variables and differences in growth trajectories.

Another potential limitation of this study is the heterogeneity among types of child dysfunction. Serious emotional disturbance is a broad term that captures a variety of emotional and behavioral difficulties including mood disorders, disruptive behavior disorders, adjustment disorders, pervasive developmental disorders, learning disabilities, and psychosis. In the current study, children's diagnostic labels were not included as predictors, but latent initial status was found to be a significant predictor of growth trajectories for both clinical and functional outcomes. While there is well-documented research on the effectiveness of interventions for externalizing behavioral problems (e.g. oppositional behavior or aggression), there is less literature on interventions for internalizing disorders (e.g. depression, anxiety, phobias, and somatization). In addition, there is relatively little research documenting effective interventions for autistic and psychotic disorders (Durlak & McGlinchy, 1999). Thus, specific types of dysfunction or specific diagnostic categories may be more amenable to system of care services. While

this sample may be representative of the wide range of psychiatric problems in children with serious emotional disturbances, the variability in types of dysfunction in the current study leads to greater difficulty in explaining relationships among predictor variables and clinical and functional outcomes.

A third limitation of this study relates to the issue of treatment fidelity. The system of care philosophy is not a discrete treatment package that specifies how each child should receive services. Rather, this philosophy provides a general framework for the provision of various services for children with serious emotional disturbances. The way in which each federal grant community implements the system of care values and principles varies across sites in a manner that best meets that community's needs and available resources (Lourie et al, 1998). Thus there is some flexibility with which grant communities operationalize the system of care philosophy. The inclusion of indicators of fidelity to system of care values and principles would provide greater insight into the general effectiveness of systems of care.

A final limitation of the current study is its limited generalizability outside systems of care. Despite the diversity of the current sample with regard to race, gender, age, and type of dysfunction, the sample may not be representative of all children with emotional and behavior difficulties. Data from both the descriptive study and child and family outcomes study portions of the national evaluation indicated that many of the children who receive systems of care services came from single-parent families. A large proportion of the families were living below the poverty level and were Medicaid recipients (Center for Mental Health Services, 1998; 1999; 2000; 2001). In addition, a requirement for participation in systems of care is that children must have a serious

emotional disturbance; therefore, only children with serious emotional disturbances were included in the current study. Children who receive mental health services outside systems of care are unlikely to have equal access to the variety of services available within systems of care. Therefore, the results from this study may be applicable to children within systems of care, rather than all children who receive any type of mental health service.

DIRECTIONS FOR FUTURE RESEARCH

Though the current study adds to the existing literature regarding the general effectiveness of systems of care for children with serious emotional disturbances, continuing research investigating predictors of clinical and functional outcomes remains important. By including individual characteristics that predict differences in rates of improvement for clinical and functional outcomes over time, this study was an important initial step in exploring for whom system of care services best work. The results from this study point to several possibilities for the direction of future systems of care research.

The variables included in the current study are clearly not an exhaustive list of possible variables that may account for differences in clinical and functional outcomes for children who participate in systems of care. A number of individual child and caregiver variables have been linked to service utilization patterns in systems of care including emotional and behavioral strengths, children's age, caregiver strain, and level of clinic and functional impairment at intake (Angold et al., 1998; Brannan, Heflinger, & Foster, 2003; Center for Mental Health Services, 1999; 2000; 2001; Doucette-Gates et al., 1999; Farmer, Burns, Angold, & Costenello, 1997; Foster, 1998; Lambert et al., 1998;

Oswald et al., 2001). Moreover, the relationship between therapeutic dosage and treatment response has been mixed in child psychotherapy literature with some research finding evidence for a dose effect, while others did not (Andrade, et al., 2000; Gorin, 1993; Heinicke & Ramsey-Klee, 1986; Pfeiffer & Strzelecki, 1990; Target & Fonagy, 1994). Thus it is difficult to draw any definitive conclusions about whether patterns of service use, including frequency, duration, and intensity, may impact clinical and functional outcomes within systems of care. As has been discussed previously, the inclusion of service utilization variables may help to clarify the relationships between predictor variables and differences in rates of improvement in clinical and functional outcomes over time. Further, the inclusion of such variables may also lead to a greater understanding of which system of care service components or combination of services yield better clinical and functional outcomes.

The finding that race (white versus non-white) was a significant predictor of the growth trajectories was an unexpected finding. Since this was a significant finding, future research should seek to obtain a greater understanding of this finding. Rather than simply categorizing race into white, non-white racial categories, future research should further break down these racial categories (e.g. Hispanic, African American, Asian American, etc.). Moreover, the system of care philosophy dictates that services for children with serious emotional disturbances should be culturally competent. The finding that white children displayed better functional outcomes on the CAFAS, but not clinical outcomes, compared to non-white children warrants further investigation to account for this finding. The inclusion of other variables, such as satisfaction with services, cultural

competency, and perceived discrimination, may further elucidate the relationship between race and outcomes in the systems of care.

There is little research regarding the relationship between behavioral and emotional strengths and clinical and functional outcomes, and therefore little is known about how children's strengths contribute to outcomes. Future research should include analysis of the individual subscales of the BERS to determine which ones account for the relationship between the total score on the BERS and clinical and functional outcomes. This type of analysis would be particularly helpful when determining which specific interventions or service components would best improve a child's functioning. If, for example, the Interpersonal Strength subscale was the strongest predictor of outcomes, children who scored low on this subscale at intake may receive services that particularly target this area (e.g. group therapy, recreational services, etc.).

Another interesting avenue for future research would be to include site level variables as predictors of clinical and functional outcomes. For example, measures of adherence, or fidelity, to the system of care philosophy would be important to include. The inclusion of site level variables would not only answer questions regarding how these variables contributed to clinical and functional outcomes, but it would also determine if potential differences in the relationships between predictor variables and outcomes across sites are related to treatment fidelity.

CONCLUSIONS AND IMPLICATIONS

The system of care concept has played an influential role in the way services are provided for children with serious emotional disturbances (Holden et al., 2001). A number of communities across the United States have received federal grant monies to develop and implement their own comprehensive, community-based systems of care (Center for Mental Health Services, 1998; 1999; 2000; 2001; Manteuffel et al., 2002; Stroul, 2003). For over a decade, there has been an ongoing cross-site evaluation to determine the general effectiveness of the system of care approach to service delivery. Very broadly, research from the outcome portion of the national evaluation has indicated that children with serious emotional disturbances who participate in systems of care exhibit improved clinical and functional outcomes over time (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003; Manteuffel et al., 2002). Other researchers have pointed out that the clinical and functional outcomes can be influenced by an array of individual characteristics, demographic variables, or psychosocial variables (Kazdin, 1995b; Kazdin & Wassell, 1999; Phillips et al., 2000). Therefore, research must also address the factors that can predict differential clinical and functional outcomes within systems of care. This study sought to explore the predictive role of a selected group of variables (behavioral and emotional strengths, caregiver strain, family functioning, and demographic variables) played on differences in rates of clinical and functional improvement over time, as well as whether these variables were related to initial levels of clinical and functional impairments.

The results of this study indicated that there are particular individual characteristics that predict differential rates of improvement in clinical and functional

outcomes for children who participate in systems of care. Several of these variables also accounted for differences in initial levels of impairment. More specifically, behavioral and emotional strengths, caregiver strain, age, sex, and race significantly predicted differences in growth trajectories for clinical and functional outcomes. Emotional and behavioral strengths, caregiver strain, family functioning, age, and sex also predicted differences in levels of clinical and functional impairments at intake into services. Race did account for differences in clinical impairments, but not functional impairments at intake. These results have a number of clinical implications.

One of the major implications from this study is in providing further support for the effectiveness of the system of care approach to service delivery for children with serious emotional disturbances. Findings from this study indicate that although the greatest amount of improvement in clinical and functional status occurs in the first six months of services, children continue to exhibit improvements over the two-year period. Moreover, those children who were more impaired at intake into services displayed faster rates of growth in the first six months, catching up to those individuals who were less impaired at intake. Thus, it seems that children who are more impaired at intake are exceptionally responsive to system of care services in the first six months.

Secondly, the rate of improvement decreased over time, especially for those children who initially displayed rapid growth within the first six months. Therefore, the effect of system of care services appeared to erode somewhat over increasing time, as these initial rates of improvement were not sustained over time. This finding was particularly true for those children who were more impaired at intake into services. Although it seems logical that the greatest amount of gain or improvement may occur

initially, with this rate of gain decreasing over increasing time periods, it seems that efforts could be made in an attempt to maintain the initial rate of improvement over a longer period of time.

Thirdly, the findings from this study provide suggestions for enhancing interventions for children and families who participate in systems of care. Both caregiver strain and behavioral and emotional strengths were significant predictors of growth rates, as well as initial levels of impairments. Caregivers experience unique stressors and burdens as a result of caring for children with serious emotional disturbances (Angold et al., 1998; Brannan & Heflinger, 2001; Brannan et al., 1997) and this study revealed that caregiver strain does impact children's clinical and functional outcomes. It seems reasonable that, in addition to family therapy and respite care, system of care services could include other types of family support. Caregiver support groups or parenting skills groups may help to alleviate some of the strain associated with caring for children with serious emotional disturbances. These types of groups can provide concrete information about how to cope with having a child with a serious emotional disturbance. In addition, the individuals who participate in these groups can provide emotional support to one another, possibly reducing caregiver burden.

The fact that behavioral and emotional strengths were also related to clinical and functional outcomes for youth within systems of care suggests other potential areas for intervention. Though children with fewer strengths exhibited more rapid rates of improvement in the first six months of system of care services, at each time point, children with greater strengths were less clinically and functionally impaired. Service

interventions that specifically develop and reinforce children's strengths may yield greater rates of improvements in clinical and functional outcomes.

As far back as the 1960's there has been concern over treatment and provision of mental health services for children and adolescents with serious emotional disturbances. The Joint Commission on the Mental Health of Children (1969) indicated that services for such children were seriously deficient. It was hoped that the system of care approach to service delivery for children with serious emotional disturbances would provide more effective, comprehensive, coordinated, community-based services for these children and their families. In the following decades, the Child and Adolescent Service System Program (CASSP) was developed with the broad goal of creating more effective community-based service delivery systems for youth with serious emotional disturbances and helping states to develop their own systems of care. The Comprehensive Community Mental Health Services for Children and Their Families Program has played a crucial role in developing and evaluating the systems of care in the United States by providing federal grants to states, communities, territories, and Native America tribes to advance their systems of care (Center for Mental Health Services, 1998; 1999; 2000; 2001; Holden et al., 2003).

It is important to reiterate that the results from the current study provide additional evidence supporting the system of care approach, indicating that children do demonstrate significant improvements in both clinical and functional outcomes over time. Previous research has indicated that the greatest improvements occur within the first six months (Holden et al., 2003). This is consistent with the findings from the current study that although children displayed continuing improvement over the two-year time period,

the greatest amount of improvement occurred in the first six months of services. Moreover, those children with the greatest clinical and functional impairments at intake into services had more rapid rates of initial improvement in outcomes, with this rate decreasing more quickly over time. This results from this study also indicated that differential rates of improvement could be explained in part by children's behavioral and emotional strength, caregiver strain, and particular demographic variables. In order to gain additional insight into the effectiveness of systems of care and the mechanisms by which predictor variables impact clinical and functional outcomes for youth, future research, particularly including service utilization information, is needed.

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